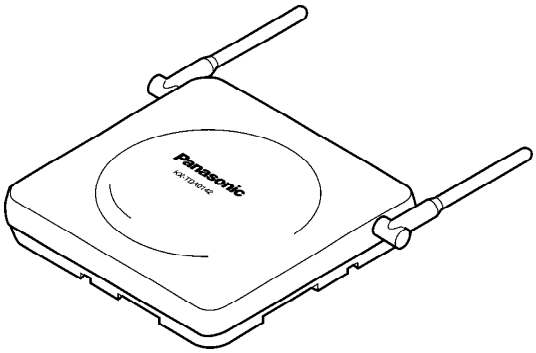
ORDER NO. KMS0304716C8

Service Manual

4-Channel Cell Station Unit for DECT Portable Station

KX-TDA0142CE

(for Europe, Asia Oceania, Middle Near East, Russia and Africa)



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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

When you note the serial number, write down all of the 11 digits. The serial number may be found on the Bottom of the unit.

Panasonic

IMPORTANT INFORMATION ABOUT LEAD FREE, (PbF), SOLDERING
If lead free solder was used in the manufacture of this product the printed circuit boards will be marked PbF.
Standard leaded, (Pb), solder can be used as usual on boards without the PbF mark.
When this mark does appear please read and follow the special instructions described in this manual on the use of PbF and how it might be permissible to use Pb solder during service and repair work.

1. ABOUT LEAD FREE SOLDER (PbF: Pb free)

Note:
In the information below, Pb, the symbol for lead in the periodic table of elements, will refer to

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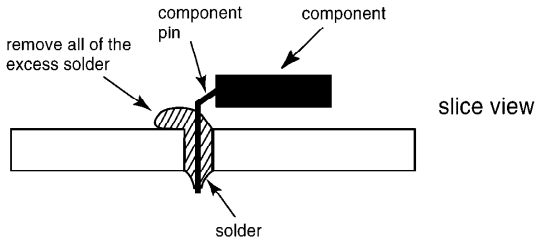
standard solder or solder that contains lead.
We will use PbF when discussing the lead free solder used in our manufacturing process which is made from Tin, (Sn), Silver, (Ag), and Copper, (Cu).
This model, and others like it, manufactured using lead free solder will have PbF stamped on the PCB. For service and repair work we suggest using the same type of solder although, with some precautions, standard Pb solder can also be used.

Caution

- **PbF solder has a melting point that is 50° ~ 70° F, (30° ~ 40°C) higher than Pb solder. Please use a soldering iron with temperature control and adjust it to 700° ± 20° F, (370° ± 10°C). In case of using high temperature soldering iron, please be careful not to heat too long.**
- **PbF solder will tend to splash if it is heated much higher than its melting point, approximately 1100°F, (600°C).**
- **If you must use Pb solder on a PCB manufactured using PbF solder, remove as much of the original PbF solder as possible and be sure that any remaining is melted prior to applying the Pb solder.**
- **When applying PbF solder to double layered boards, please check the component side for excess which may flow onto the opposite side (See figure, below).**



1.1. SUGGESTED PbF SOLDER

There are several types of PbF solder available commercially. While this product is manufactured using Tin, Silver, and Copper,
(Sn+Ag+Cu), you can also use Tin and Copper, (Sn+Cu), or Tin, Zinc, and Bismuth, (Sn+Zn+Bi). Please check the manufac
turer's specific instructions for the melting points of their products and any precautions for using their product with other
materials.
The following lead free (PbF) solder wire sizes are recommended for service of this product: 0.3mm, 0.6mm and 1.0mm.

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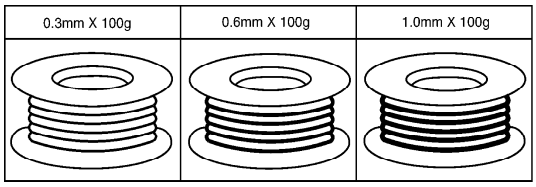
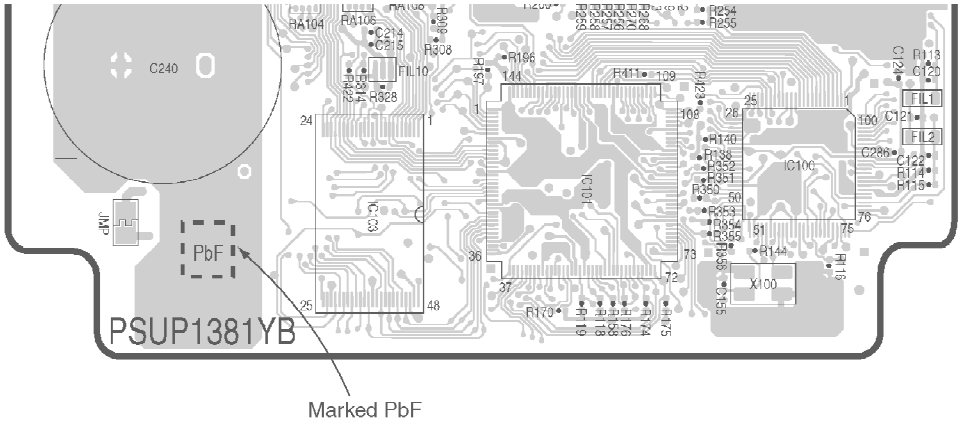


1.1.1. HOW TO RECOGNIZE THAT Pb FREE SOLDER IS USED

“PbF” is marked on the PCB to show that Pb free solder is used. (See the figure below.)



1.2. NOTE

Current models of the KX-TDA0142CE use PbF. Early-production models do not.

2. FOR SERVICE TECHNICIANS

ICs and LSIs are vulnerable to static electricity.

When repairing, the following precautions will help prevent recurring malfunctions.

1. Cover the plastic parts boxes with aluminum foil.

2. Ground the soldering irons.

3. Use a conductive mat on the worktable.

4. Do not touch IC or LSI pins with bare fingers.

3. CAUTION

3.1. NOTE

When you note the serial number, write down all of the 11 digits.
The serial number may be found on the label affixed to the bottom of the unit.

4. SPECIFICATIONS

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Item	Description
Radio Access Method	Multi Carrier TDMA-TDD
Frequency Band	1880 MHz to 1900 MHz*1 (*1 The number may vary depending on the area . In Taiwan, it is 1880 MHz to 1895 MHz.)
Number of Carriers	10*2 (*2 The number may vary depending on the country /area . In Ta is 8.)
Carrier Spacing	1728 kHz
Bit Rate	1152 kbps
Carrier Multiplex	TDMA, 24 (Tx12, Rx12) slots per frame
Frame Length	10 ms
Modulation Scheme	GFSK
	Roll-off factor=0.5 50% roll-off in the transmitter
Data Coding for Modulator	Differential Coding
Voice CODEC	32 kbps ADPCM (CCITT G.721)
Operation range	Up to 300 m outdoors. Up to 50 m indoors.
Transmission Output	Average 10 mW Peak 250 mW
Operating conditions	0-40°C, 20-80% relative air humidity (not condensing)
Dimension	Cell Station 140 (L) mm × 172 (W) mm × 34 (D) mm (5 1/2 × 6 25/32 × 1
Weight	about 265 g

5. CONNECTING THE CELL STATION TO THE HYBRID IP-PBX

Refer to the following example to connect a CS to the Hybrid IP-PBX.

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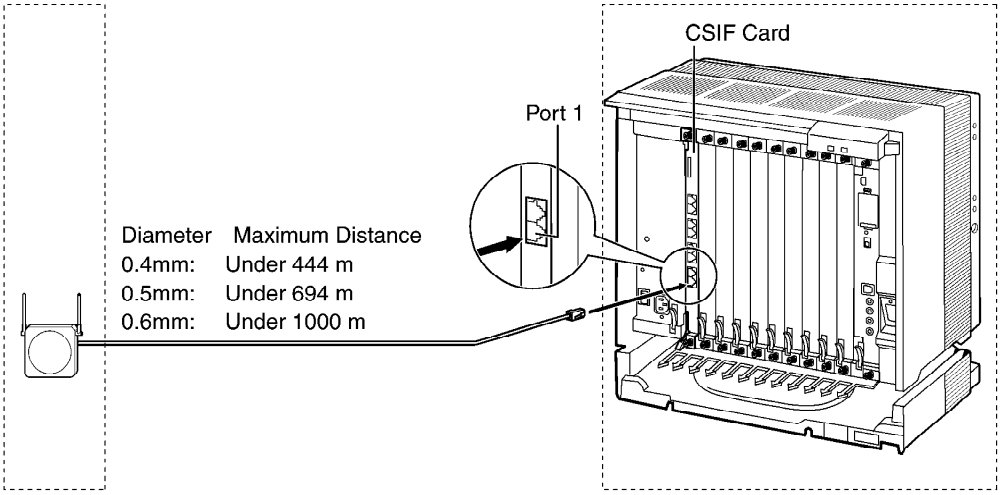

CS (RJ11)

Signal Name	Pin No.
D1	1
POWH	2
POWL	3
D2	4

CSIF card (RJ45)

Pin No.	Signal Name
1	
2	
3	D1
4	POWH
5	POWL
6	D2
7	
8	

Notes

- Pin assingnments for the ports 2 to 8 are the same as those of the port 1.

Accessory and User-supplied Items for the CS
Accessory: screw x 2, washer x 2, ferrite core x 1.
User-supplied: RJ11 connector

5.1. Connecting the CS

1. Connect the cable from the CS interface card to the CS.

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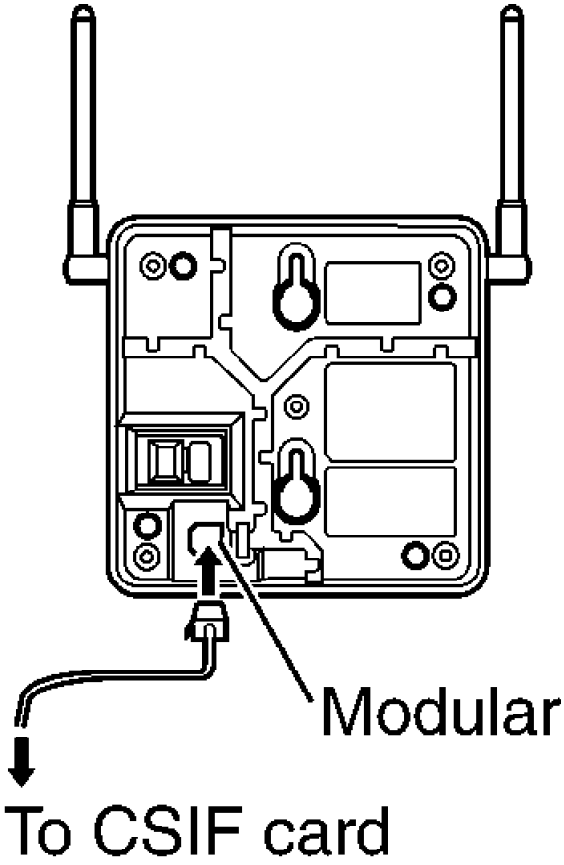

2. Pass the cable through the groove of the CS (in any direction depending on your convenience). Wrap the cable once around the ferrite core .Then close the case of the ferrite core.

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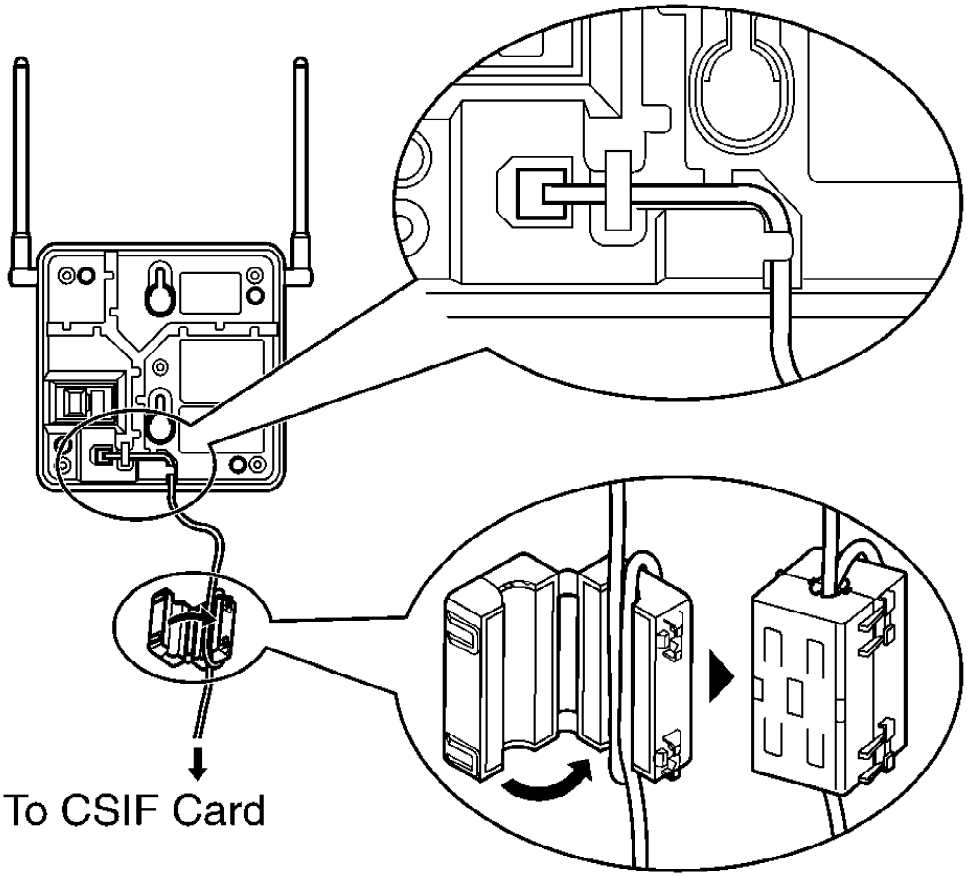
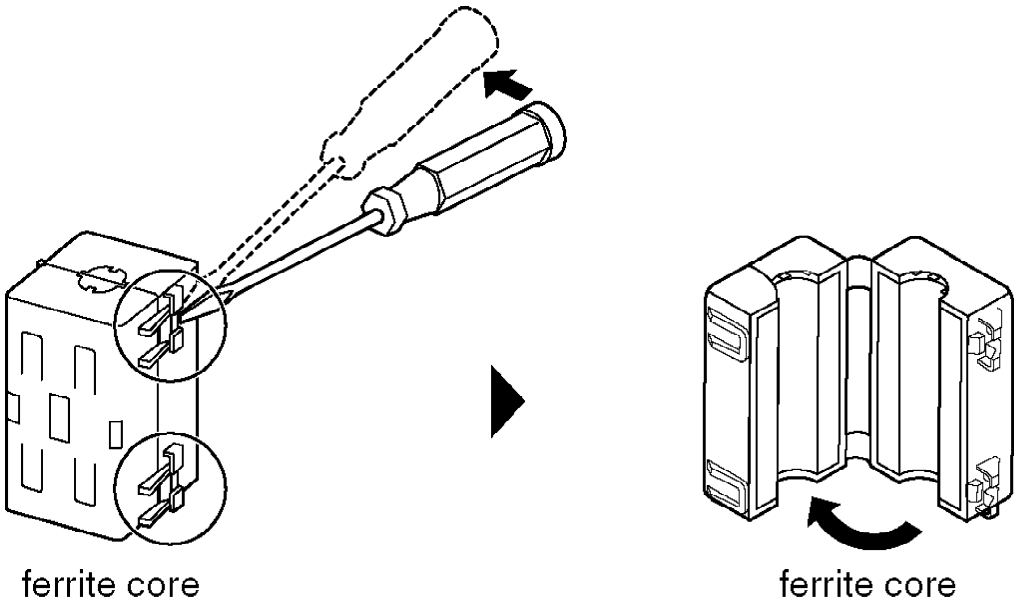


Note

If you need to open the ferrite core, use a flathead screwdriver to unlatch the case of the ferrite core.



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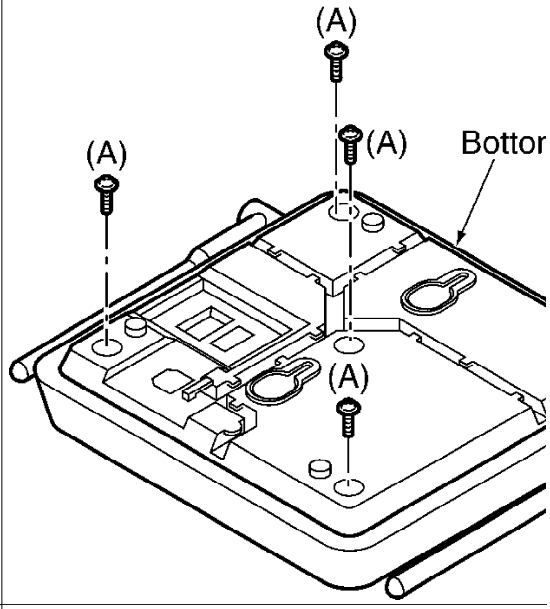
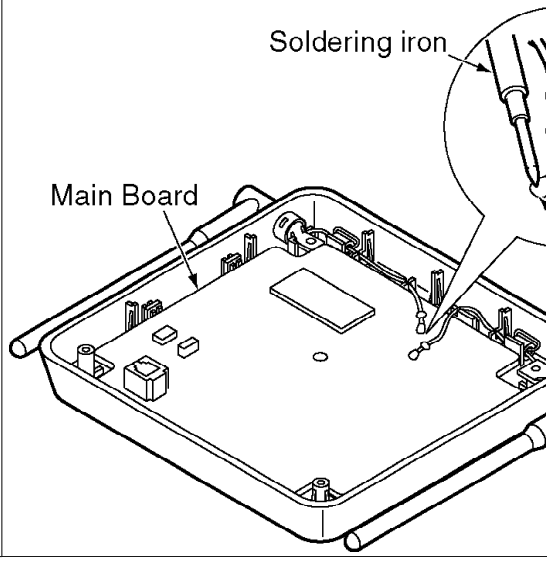
6. DISASSEMBLY INSTRUCTIONS

1. Remove 5 Screws (A). **2. Remove the Bottom Cabinet.**	
2. Remove the Solder on Cable of the Main Board by the Soldering iron.	

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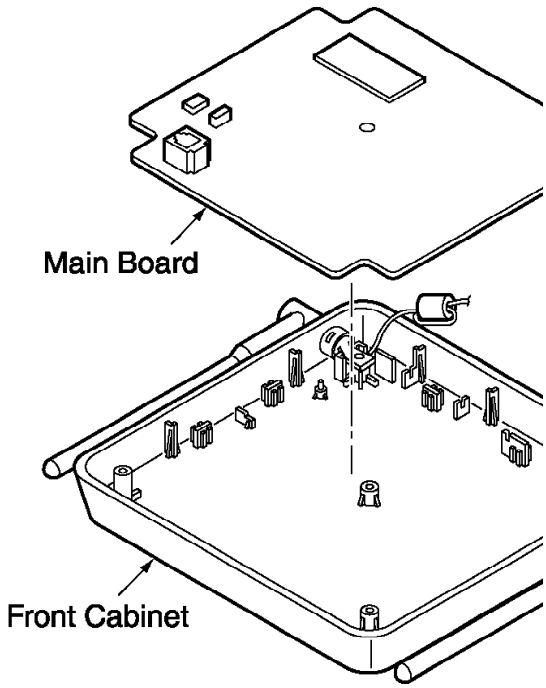
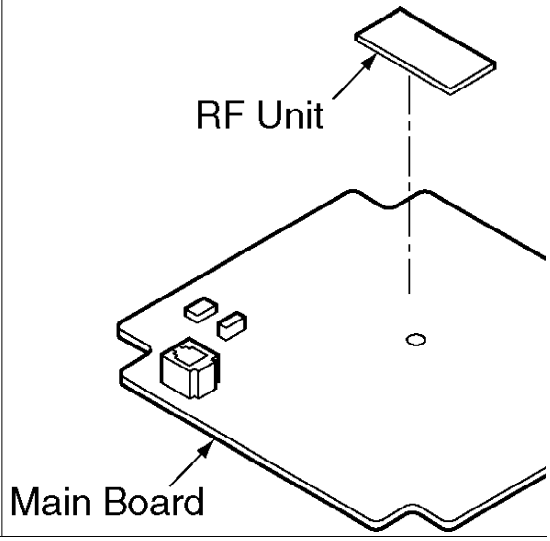
3. Remove the Main Board from the Front Cabinet.	
2. Remove the RF unit from the Main Board.	

7. TROUBLESHOOTING GUIDES

7.1. Portable Station (PS) cannot register to cell station (CS) or PS does not link CS.

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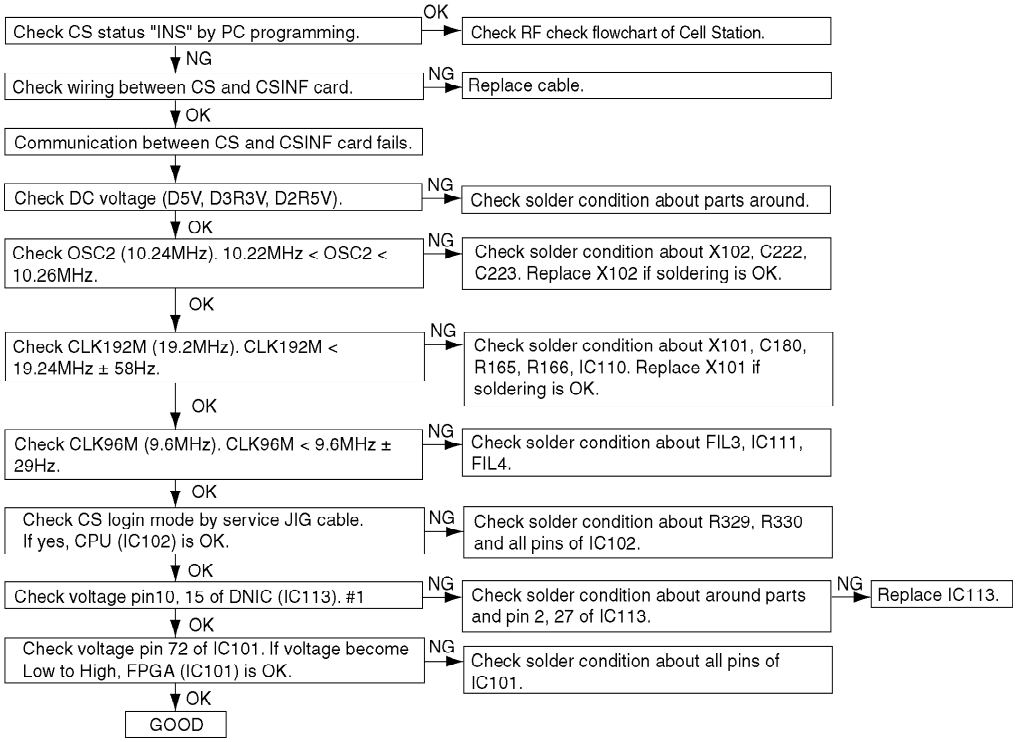
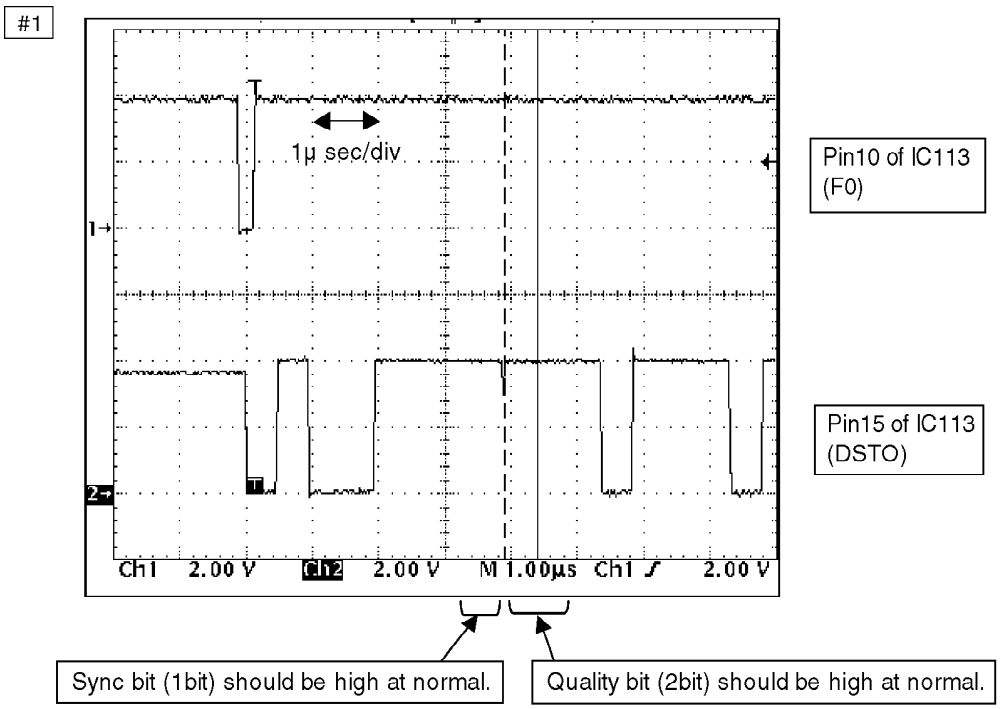

Check CS status "INS" by PC programming.
OK
Check RF check flowchart of Cell Station.
NG
Check wiring between CS and CSINF card.
NG
Replace cable.
OK
Communication between CS and CSINF card fails.
Check DC voltage (D5V, D3R3V, D2R5V).
NG
Check solder condition about parts around.
OK
Check OSC2 (10.24MHz). 10.22MHz < OSC2 < 10.26MHz.
NG
Check solder condition about X102, C222, C223. Replace X102 if soldering is OK.
OK
Check CLK192M (19.2MHz). CLK192M < 19.24MHz ± 58Hz.
NG
Check solder condition about X101, C180, R165, R166, IC110. Replace X101 if soldering is OK.
OK
Check CLK96M (9.6MHz). CLK96M < 9.6MHz ± 29Hz.
NG
Check solder condition about FIL3, IC111, FIL4.
OK
Check CS login mode by service JIG cable. If yes, CPU (IC102) is OK.
NG
Check solder condition about R329, R330 and all pins of IC102.
OK
Check voltage pin10, 15 of DNIC (IC113). #1
NG
Check solder condition about around parts and pin 2, 27 of IC113.
NG
Replace IC113.
OK
Check voltage pin 72 of IC101. If voltage become Low to High, FPGA (IC101) is OK.
NG
Check solder condition about all pins of IC101.
OK
GOOD


#1
1µ sec/div
Pin10 of IC113 (F0)
Pin15 of IC113 (DSTO)
Ch1 2.00 V
Ch2 2.00 V
M 1.00µs Ch1 ƒ 2.00 V
Sync bit (1bit) should be high at normal.
Quality bit (2bit) should be high at normal.

7.2. RF check flowchart for Cell Station (CS)

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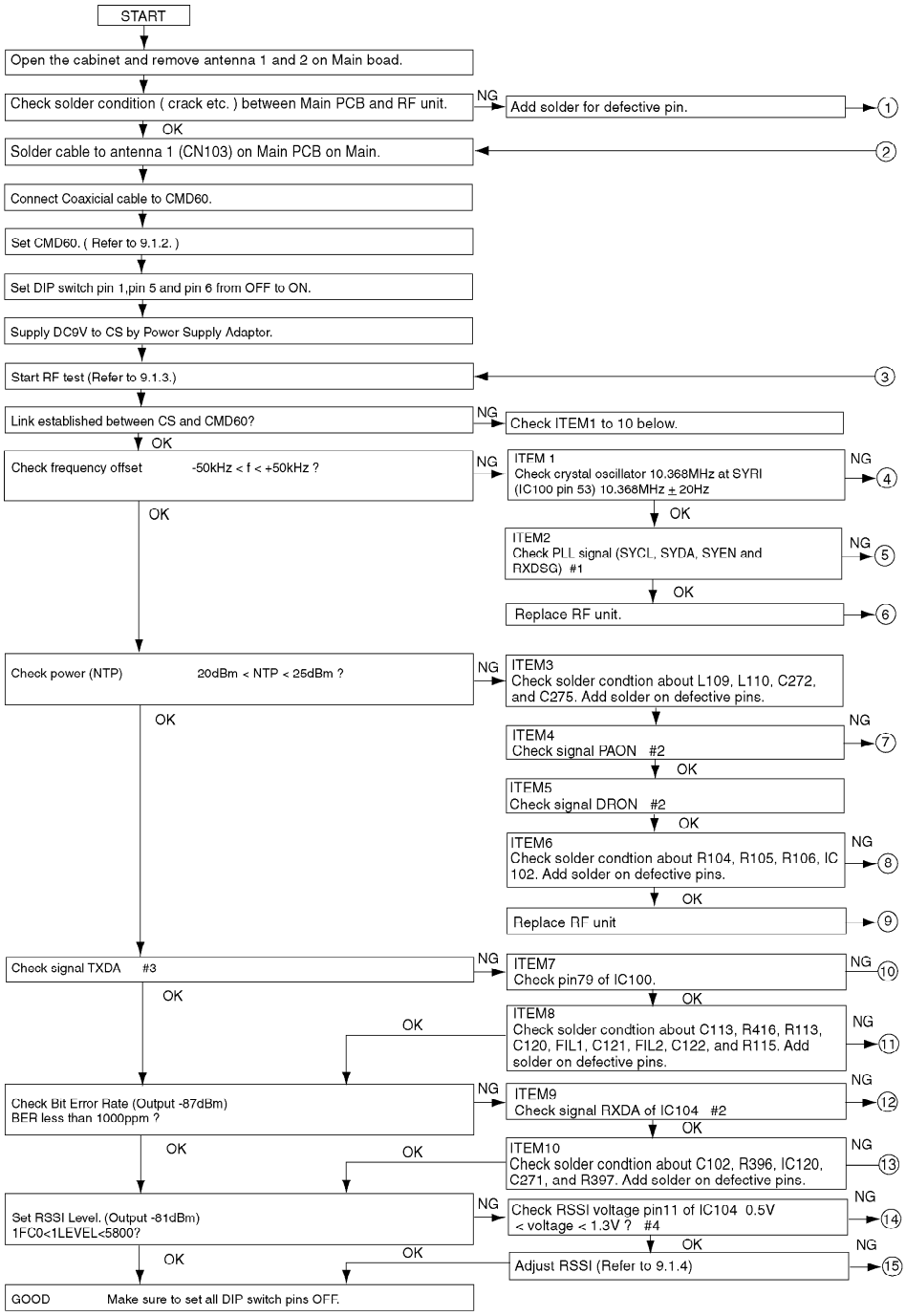

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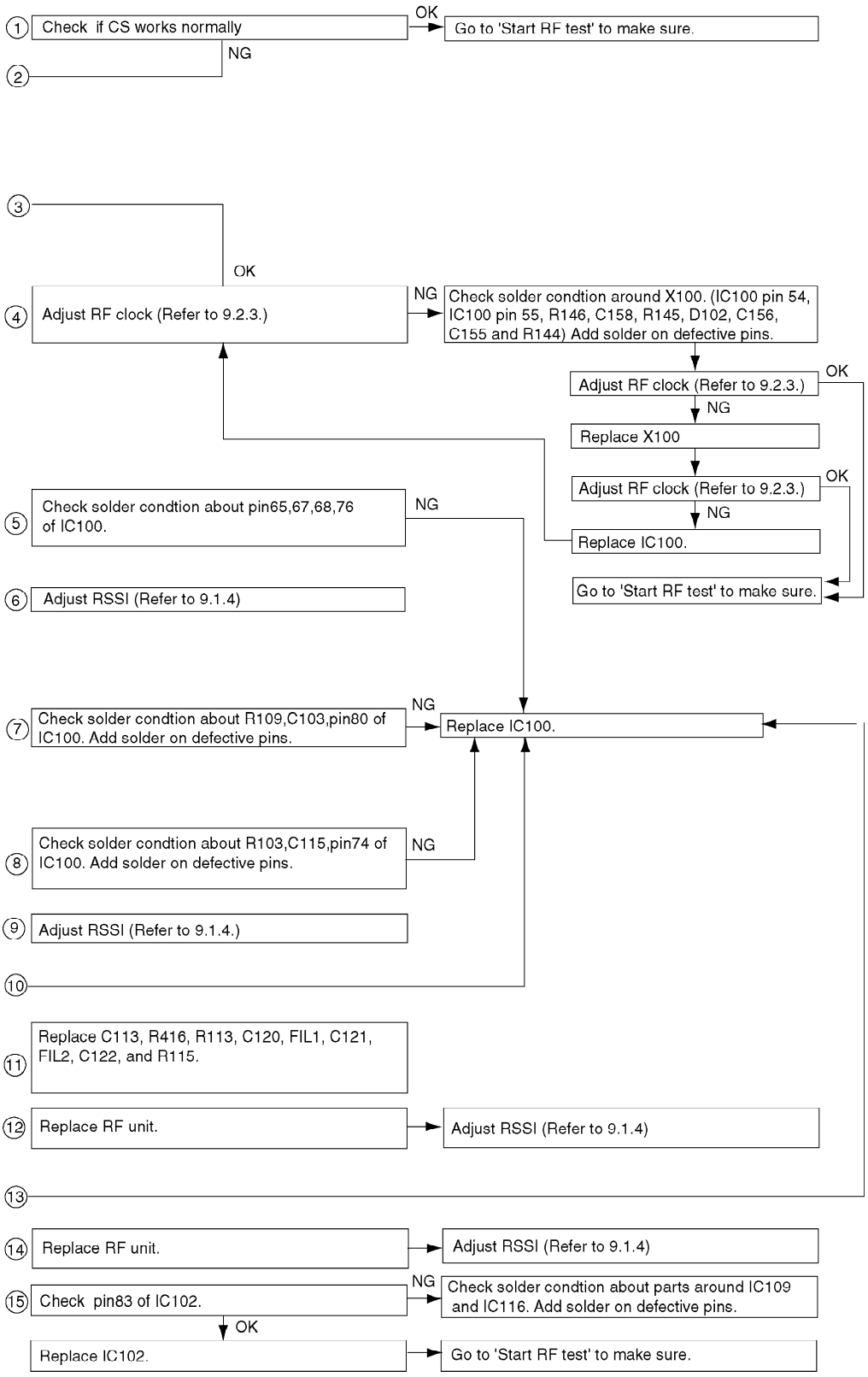

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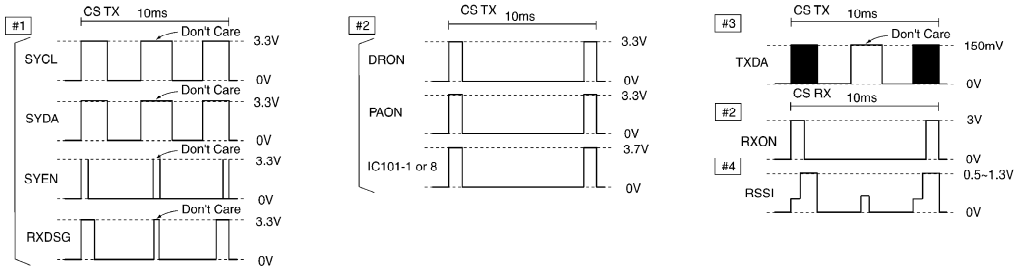


8. CS login mode

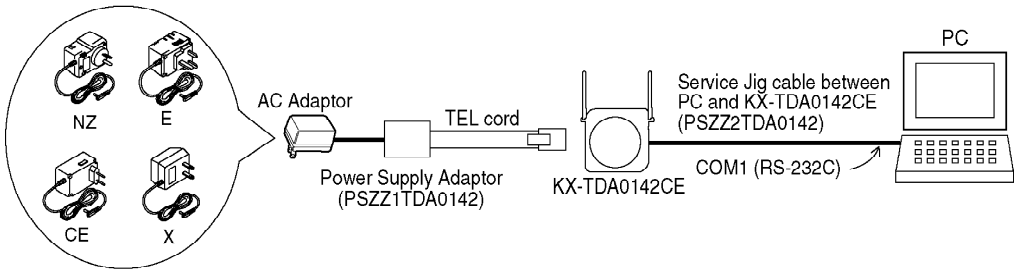
- Required Equipments

1. (PC) Personal Computer with serial port (Windows2000/98 or previous version with communication software)
2. Power Supply Adaptor (PSZZ1TDA0142)
3. Service Jip cable (PSZZ2TDA0142)
4. AC Adaptor or Battery Box (PSZZTD142CE)

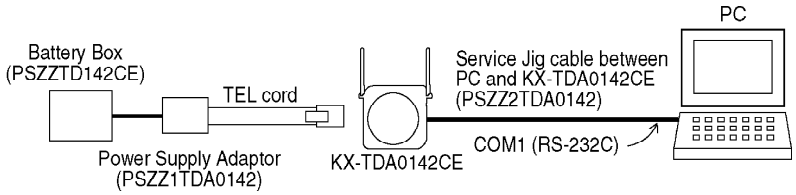
8.1. Initial setting

1.1 Connect KX-TDA0142CE to your PC with the Service JIG cable, and then power on KX-TDA0142CE with a Power supply adaptor.

(1) In case AC Adaptor



(2) In case Battery Box



1.2 Property

Please set property as follows

Port	**COM1**
Bit per second	**19200**
Data bits	**8**
Parity	**None**
Stop bit	**1**
Flow control	**Xon/Xoff**

1.3 ASCII setup

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Please set as follows.

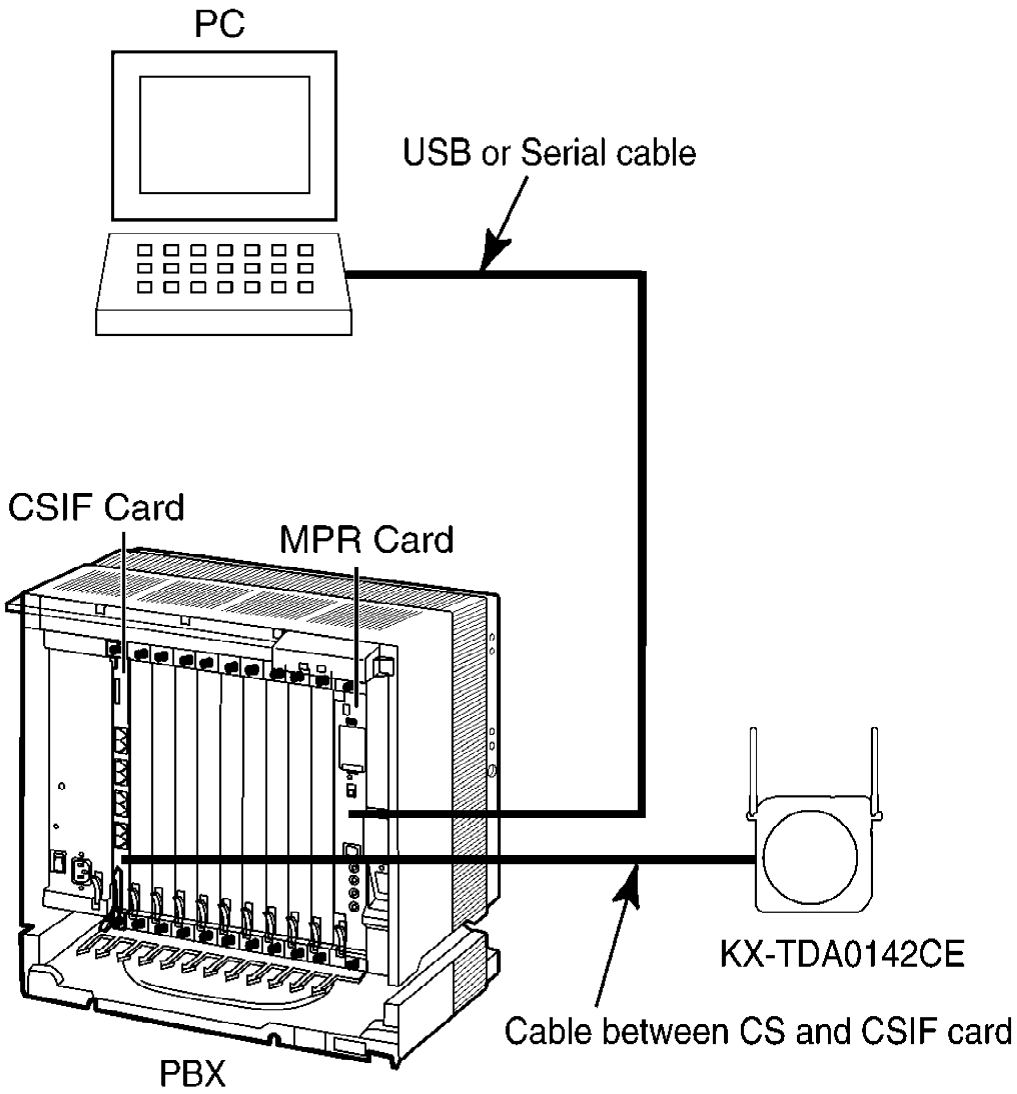
2.1 How to enter “CS login mode”.
After waiting for about 10 seconds, press Ctrl and “D” simultaneously to enter “CS login mode” (The following window is displayed.).

2.2. Press “VER” and Enter, then software version is appeared on display.
If version of TDA0142CE is appeared, then operation of CPU is OK.

Note:
"" show software version. The number of the version are not concerned with the "CS login mode" performance. If version of software is appeared, then operation of CPU is OK.**

8.2. How to check the status of CS with a PC program

<< Initial setting >>



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1. **Connect KX-TDA0142CE (Cell Station) with cable between CS and CSINF card.**
2. **Connect PBX and PC with USB or Serial cable, then execute “PC programming”.**
3. **Press “Configuration” and “CSINF Port”.**
4. **Confirm Cell Station Status.**
   INS: In Service → CS is normal
   OUS: Out of Service → Communication data between CS and CSIF card is OK, but CS does not transmit the carrier.
   Fault: Fault → CS is not active.

9. TEST AND ADJUSTMENT

9.1. TEST AND ADJUSTMENT FOR RF PART

Note:
About the software version
Update the software to the latest version before performing the RF test.

9.1.1. Required Equipments

1. **CMD60**
2. **(PC) Personal Computer with serial port (Windows2000/98 or previous version with communication software)**
3. **Power Supply Adaptor (PSZZ1TDA0142)**
4. **Service JIG cable (PSZZ2TDA0142)**
5. **AC adaptor (KX-TCA1) or Battery Box (PSZZTD142CE)**

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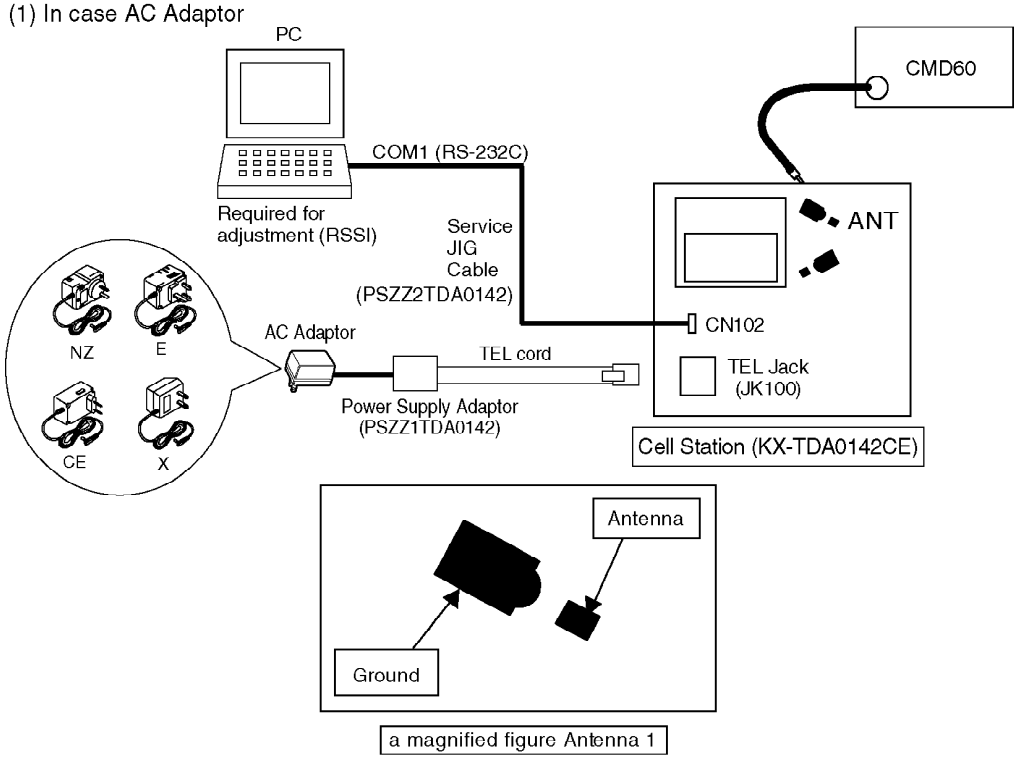
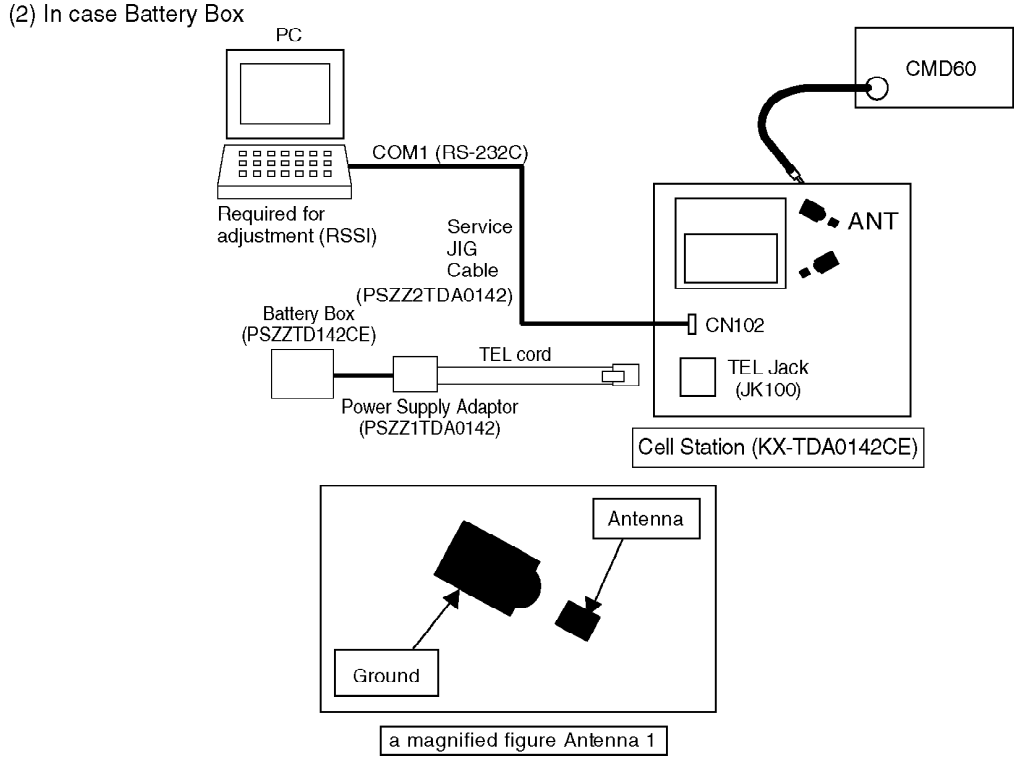
(1) In case AC Adaptor



(2) In case Battery Box



9.1.2. RF test

9.1.2.1. Preparation for RF test

1. Remove the under cabinet (Refer to 6. DISASSEMBLY INSTRUCTION 1.)

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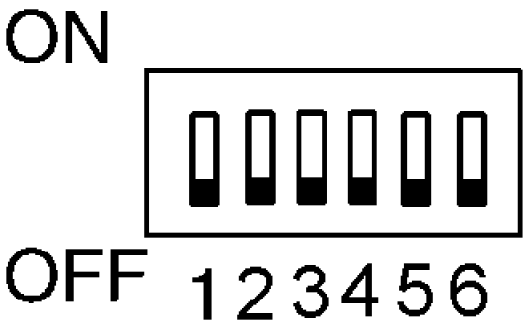
2. Remove 2 antennas from CN103 and CN104 (Refer to 6. DISASSEMBLY INSTRUCTION 2.)
3. Remove the P.C.B from upper cabinet (Refer to 6. DISASSEMBLY INSTRUCTION 3.)
4. Solder cable to ANT1(CN103) (Refer to figure)
5. CMD60 set up.

TEST MODE	FP	
CONFIG MENU	SIGN. PARAM	
SCRAMBLE	OFF	
ANTENNA	1 (at CN103)	* If you solder cable to ANT2 (CN104) , you should sele the CMD60.
PMID	0000	
TRAFFIC SLOT	0	
TRAFFIC CARRIER	5	



6. Set Dip switch pin 1 , pin 5 ,and pin 6 from OFF to ON.
7. Connect power supply cable and AC adaptor.

9.1.2.2. RF test

1. Set the CMD60 to MANUAL TEST.
2. Set the CMD60 TRAFFIC CARRIER to 5.
3. Press ACCEPT RFPI and SETUP CONNECT on the CMD60.
4. Check Power (NTP) : must be +20 to +25dBm
5. Press MODULATION.
6. Set Data Type to "FIG 31".
7. Check the Frequency Offset : must be 0±50kHz.
8. Check the Deviation (Max. ±B Field) with Data Type "FIG.31" :

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must be ±259 to ±403kHz.

9. Check the Frequency Drift : must be 0 ±35kHz/ms.
10. Press MENU UP " ↑ " on the CMD60.
11. Press POWER RAMP.
12. Check the Burst fits mask.
13. Press MENU UP " ↑ " on the CMD60.
14. Press BER.
15. Obtain the sensitivity by slowly reducing the RF LEVEL until the BER falls below 1000ppm.
    The sensitivity is the RF LEVEL reading at this point.
    must be < -87 dBm.
16. Press MENU UP " ↑ " on the CMD60.
17. Press BEARER RELEASE and disconnect power supply adaptor.

Note:
These tests can be repeated on Traffic Carrier 0 and 9.
Make sure to set all dip switches to OFF after RF test.

9.1.3. Adjustment (RSSI)

9.1.3.1. Preparation for adjustment (RSSI)

1. Remove the under cabinet (Refer to 6. DISASSEMBLY INSTRUCTION 1.)
2. Remove 2 antennas from CN103 and CN104 (Refer to 6. DISASSEMBLY INSTRUCTION 2.)
3. Remove the P.C.B from upper cabinet (Refer to 6. DISASSEMBLY INSTRUCTION 3.)
4. Solder cable to ANT1(CN103) (Refer to figure)
5. CMD60 set up.

TEST MODE	FP	
CONFIG MENU	SIGN. PARAM	
SCRAMBLE	OFF	
ANTENNA	1 (at CN103)	* If you solder cable to ANT2 (CN104) , you should sele the CMD60.
PMID	0000	
TRAFFIC SLOT	0	
TRAFFIC CARRIER	5	

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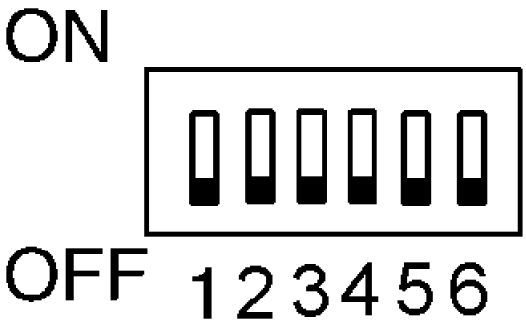
Set CMD60 into RF-generator mode. **Default Display → MODULE TEST** **→ RFGEN**

	Default	After setting
FREQ./RF CHAN.	**1897.344MHz (0CH)**	**1888.704MHz (5CH)**
DEVIATION	**288kHz**	**0kHz**
SIGNAL	**CONST.ENVELOP (00001111)**	**CONST.ENVELOP (00001111)**
RF LEVEL	**-40 dBm**	**-40 dBm**

6. Set Dip switch all pins to OFF.



7. Connect the PC to the CS by service JIG cable

8. Start up the PC and start the hyper terminal

9. Set the hyper terminal property as follows / (also refer to 8.1. initial setting)

serial port setup	
Port	**COM1**
Bit per second	**19200**
Data bits	**8**
Parity	**None**
Stop bit	**1**
Flow control	**Xon/Xoff**

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serial port setup
check next check boxes ASCII Sending - Sending line ends with line feeds ASCII Receiving - Append line feeds to incoming line ends Warp lines that exceed terminal width

10. Supply a voltage to the TEL jack from the AC adaptor (KX-TCA1) / via power supply adaptor (PSZZ1TDA0142)

9.1.3.2. Adjustment (RSSI) test

Description of RSSI Calibration Process
Text following “Command:” is the input command for the terminal connected to the CS.
Text following “Response:” is the terminal display response data.
Confirm the response before proceeding to the next step.If no response is set. shut off power and repeat from the beginning.

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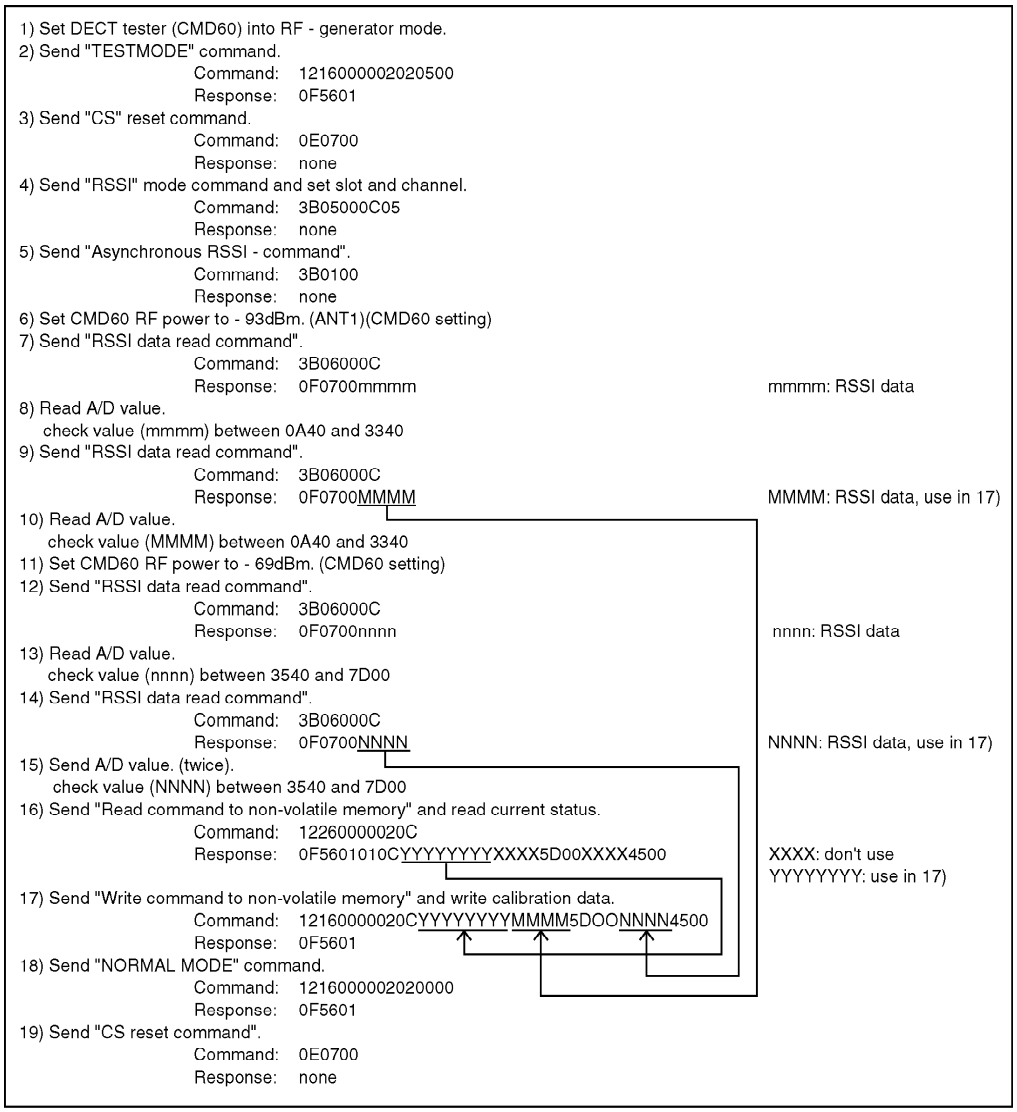
1) Set DECT tester (CMD60) into RF - generator mode.
2) Send "TESTMODE" command.
Command: 1216000002020500
Response: 0F5601
3) Send "CS" reset command.
Command: 0E0700
Response: none
4) Send "RSSI" mode command and set slot and channel.
Command: 3B05000C05
Response: none
5) Send "Asynchronous RSSI - command".
Command: 3B0100
Response: none
6) Set CMD60 RF power to - 93dBm. (ANT1)(CMD60 setting)
7) Send "RSSI data read command".
Command: 3B06000C
Response: 0F0700mmmm
mmmm: RSSI data
8) Read A/D value.
check value (mmmm) between 0A40 and 3340
9) Send "RSSI data read command".
Command: 3B06000C
Response: 0F0700MMMM
MMMM: RSSI data, use in 17)
10) Read A/D value.
check value (MMMM) between 0A40 and 3340
11) Set CMD60 RF power to - 69dBm. (CMD60 setting)
12) Send "RSSI data read command".
Command: 3B06000C
Response: 0F0700nnnn
nnnn: RSSI data
13) Read A/D value.
check value (nnnn) between 3540 and 7D00
14) Send "RSSI data read command".
Command: 3B06000C
Response: 0F0700NNNN
NNNN: RSSI data, use in 17)
15) Send A/D value. (twice).
check value (NNNN) between 3540 and 7D00
16) Send "Read command to non-volatile memory" and read current status.
Command: 12260000020C
Response: 0F5601010CYYYYYYYYXXXX5D00XXXX4500
XXXX: don't use
YYYYYYYY: use in 17)
17) Send "Write command to non-volatile memory" and write calibration data.
Command: 12160000020CYYYYYYYYMMMM5DOONNNN4500
Response: 0F5601
18) Send "NORMAL MODE" command.
Command: 1216000002020000
Response: 0F5601
19) Send "CS reset command".
Command: 0E0700
Response: none

9.2. ADJUSTMENT FOR MAIN PART

9.2.1. Required Equipments

1. **Frequency counter**
2. **(PC) Personal Computer with serial port (Windows 2000/98 or previous version)**
3. **Power supply adaptor (PSZZ1TDA0142)**
4. **Service JIG cable (PSZZ2TDA0142)**
5. **AC Adaptor (KX-TCA1) or Battery Box (PSZZTD142CE)**

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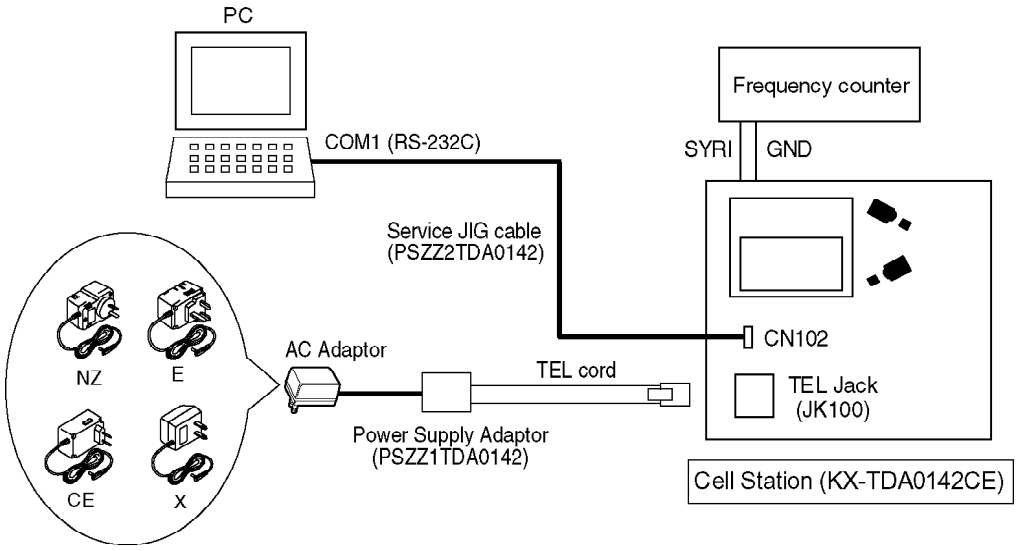
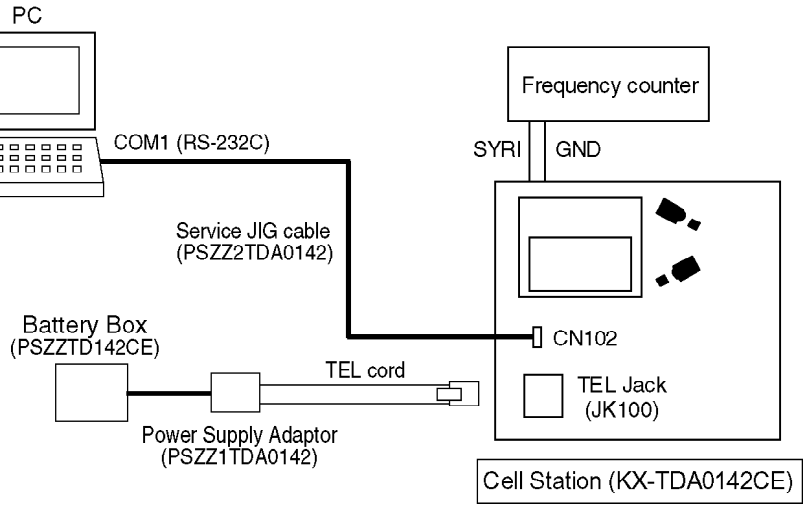
(1) In case AC Adaptor



(2) In case Battery Box



9.2.2. Preparation

1. **Remove the under cabinet (Refer to 6. DISASSEMBLY INSTRUCTIONS)**
2. **Remove 2 antennas from CN3 and CN104 (Refer to 6. DISASSEMBLY INSTRUCTIONS)**
3. **Remove the P.C.B from the upper cabinet (Refer to 6. DISASSEMBLY INSTRUCTIONS)**
4. **Connect PC to the CS by service JIG cable**
5. **Start up the PC and start the hyperterminal**
6. **Set the hyperterminal property as follows**

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(also refer to 8.1. initial setting)

serial port setup	
Port	COM1
Bit per second	19200
Data bits	8
Parity	None
Stop bit	1
Flow control	Xon/Xoff

serial port setup
check next check boxies ASCII Sending - Sending line ends with line feeds ASCII Receiving - Append line feeds to incoming line ends Warp line that exceed terminal width

7. Supply a voltage to the TEL jack from the AC adaptor (KX-TCA1) / via power supply Adaptor (PSZZ1TDA0142)
8. Connect the frequency counter probes the P.C.B. the test pads (SYRI, GND).

9.2.3. Adjustment (RF Clock)

Description of RF Calibration Process
Text following “Command:” is the input command for the terminal connected to the CS.
Text following “Response:” is the terminal display response data.
Confirm the response before proceeding to the next step.If no response is set. shot off power and repeat from the beginning.

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1) Send “Read command to non-volatile memory” and read current status.
Command: 122600000204
Response: 0F5601040000XX00 XX:Current value
2) Measure frequency at SYRI test point. (SYRI-GND)
(Refer to PRINTED CIRCUIT BOARD 21.2 Bottom View p46)
If measured frequency is within the range of 10.368 MHz ±20 Hz, proceed to step 5.
3) Read “Clock frequency set - command”, and set calibration data.
Command: 0E060000YY YY:Adjustment value
Response: none
If measured frequency is high, set YY to a value lower than current value (XX). If low, set YY to a value
higher than current
value (XX).
4) Repeat (2) to (3) until frequency is within test standard.
If measured frequency is within the range of 10.386 MHz ±20 Hz, proceed
to next step.
5) Send “Write command to non-volatile memory” and write calibration
data.
Command: 12160000020405 00YY00
Response: 0F5601
6) Send “CS reset command” and reset CS.
Command: 0E0700
Response: none
7) Measure frequency (RF clock) at SYRI again at last.

10. FREQUENCY TABLE (MHz)

Tx Frequency	Rx Frequency
Channel	Frequency (MHz)
00	1897.344
01	1895.616
02	1893.888
03	1892.160
04	1890.432
05	1888.704
06	1886.976
07	1885.248
08	1883.520
09	1881.792

11. BLOCK DIAGRAM

11.1. MAIN BOARD

11.2. RF BLOCK

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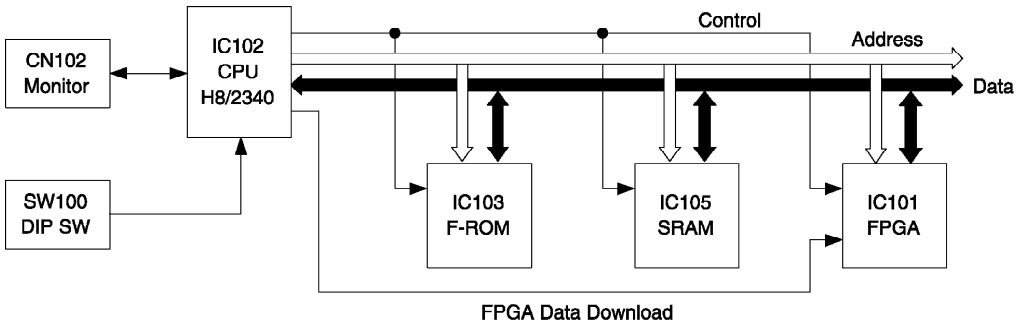
12. HARDWARE DESCRIPTION

12.1. FUNCTION DESCRIPTION

KX-TDA0142CE is the Cell Station (CS) for TDA series. CS converts voice data from PBX to radio signal and transmits to Portable Station (PS). Conversely CS converts radio signal from PS to voice data and transmits to PBX.
This unit is composed of 2 PCBs. One is the Control Board to handle voice data and control data from PBX. The other is the RF module to transmit and receive RF signal.

12.2. CPU CIRCUIT

The CPU (IC102) is H8S/2340 manufactured by HITACHI that has 16 bits data bus and 2kbits RAM internally. This CPU processes control command from PBX and PS.
Application software is stored in 4Mbit Flash Memory (IC103). This Flash Memory is so called Dual Operation type Flash. It is possible to write data onto this Flash Memory in active status so that this Flash Memory is used as EEPROM. And this is proper for remote program downloading preventing fatal data corruption by power failure during program downloading, too.
And the data for FPGA (IC101) is stored in this Flash Memory, too. When CS starts up, the FPGA data is downloaded to the FPGA from the Flash Memory via the CPU.
Furthermore calibration data for RSSI measurement and clock is stored in the Flash Memory, too.
1Mbit SRAM is used as the work area. CN102 is the communication port for service purpose. CN102 is connected to the serial port of the CPU.
SW100 is 6bits DIP switch to set the operating modes of CS, site survey mode, program download mode and so on.



12.3. LINE INTERFACE

This circuit handles data communication to CSIF card(KX-TDA0144). CS is connected to CSIF card by 4 wires. The power voltage of CS is DC 40V supplied from CSIF card by 4 wires. The analog signal is supplied on outside 2 wires. Voice data, control data and superframe synchronization signal for CS synchronization is carried on this analog signal.
The signal from CSIF card is provided to JK100, and provided to DNIC (IC113) via filter and pulse transformer (T100).
DNIC is the abbreviation of Digital Network IC. DNIC has 2 operating modes, namely master mode and slave mode.DNIC works as slave mode in CS. DNIC extracts clocks (8kHz frame

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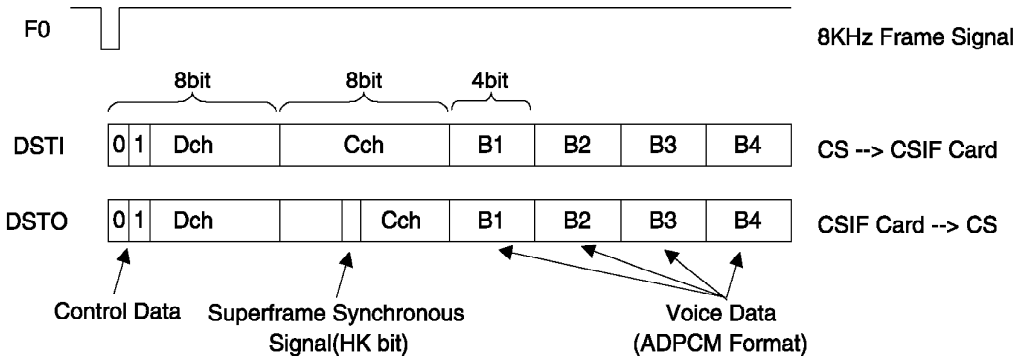
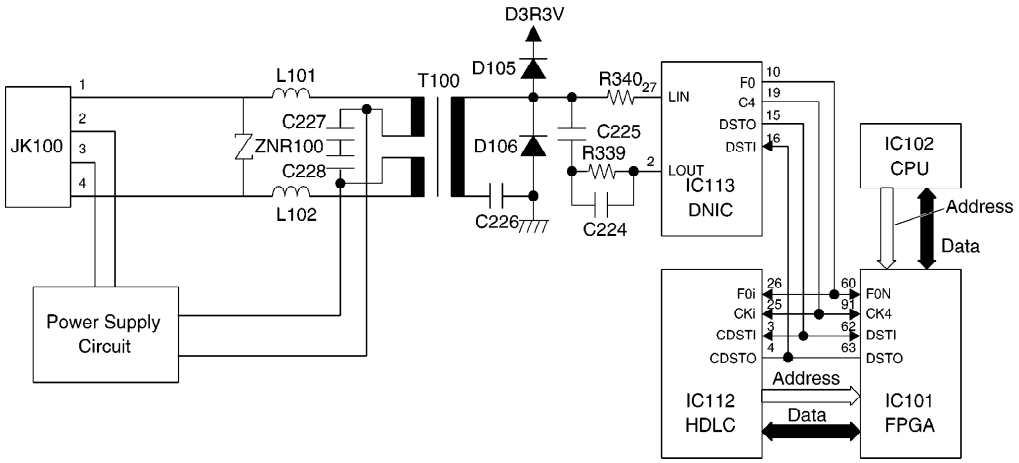
signal and 4MHz clock) and digital data in ST-BUS format from the analog signal provided by PBX.
These clocks and digital data is transferred to FPGA (IC101) and HDLC control IC (IC112). HDLC means High Level Data Line Control, a protocol for highly reliable data communication.
This ST-BUS digital data contains data channel, control channel and voice channel.
The first 2bits of the data channel is the control data. The control data is transferred to HDLC IC and buffered in it. When the size of buffered data reaches certain value, HDLC IC interrupts to the CPU. Then the CPU reads the control data from HDLC IC.
Voice channel contains 4 ADPCM data. And superframe synchronization signal is carried by HK bit of control channel.
4 ADPCM data and superframe synchronization signal is transferred to FPGA (IC101).

Note:
The GND of CS(KX-TDA0142) is not common to the GND of the PBX itself, care must be taken when using a measuring device such as an oscilloscope.(Make sure to use the measuring device with its frame ground open.)





12.4. FPGA

FPGA (IC101) has the following features.

(1) ST-BUS I/F,IOM-2 I/F

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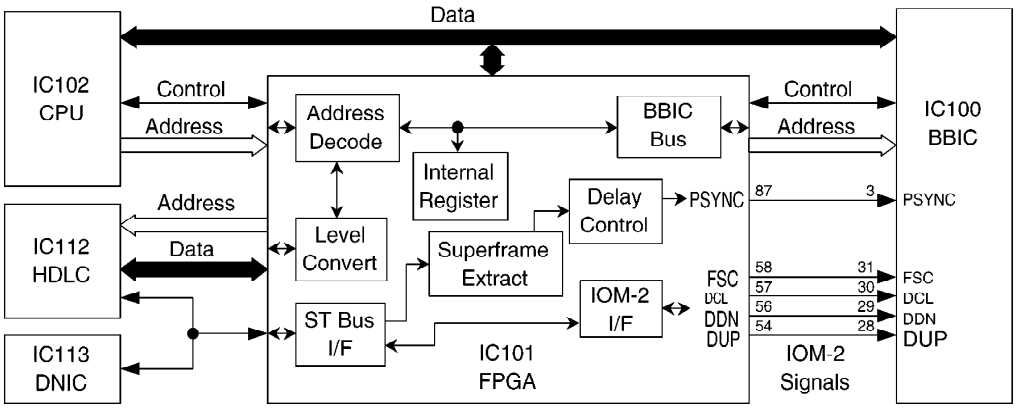
Extracts voice data from ST-BUS digital data and changes format to IOM-2 format, then provides to BBIC.

(2) Superframe detection, delay compensation
Detects super frame synchronization signal from HK bit in the ST-BUS digital data and compensates time difference of delay caused by the different cable length from CSIF card, then provides to PSYNC pin of BBIC.

(3) BBIC I/F
Adjust access timing of address lines and bus control signal between the CPU and BBIC.

(4) Address decoder, internal registers
Address decoder to generate chip select signal for other ICs and internal 16bytes registers to set FPGA operation.

(5) HDLC IC level shifter
The power supply voltage of HDLC IC (IC112) is 5V so that HDLC IC cannot be connected to CPU directly because of overvoltage.
The address bus and data bus of the CPU is connected to HDLC IC via FPGA which has 5V tolerant I/Os.



12.5. RF INTERFACE CIRCUIT

Data signals for RF control and RX/TX data is connected between BBIC and RF module.
The modulated signal is provided to 2 antennas via CN103 and CN104.

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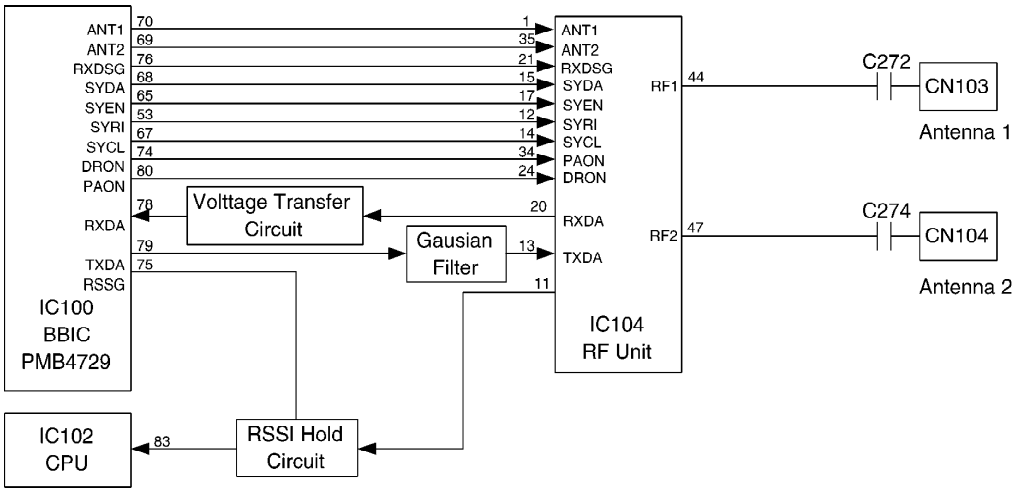

BBIC
PMB4729 manufactured by Infineon

GAUSSIAN FILTER
Gaussian filter is used for pulse shaping of TXDA signal that is sent from BBIC to RF module.

LEVEL SHIFTER
Level shifter is used for voltage matching of RXDA from RF module to BBIC.

RSSI HOLD CIRCUIT
RSSI signal from RF module is hold at this circuitry and fed to A/D port of the CPU.

RF MODULE (SEE BLOCK DIAGRAM Fig 11.2)
The RF Module consists of two main components: PMB6610 transceiver and PMB6819 POWER AMP. / In the transceiver, the 10.368MHz clock signal SYCL is multiplied to approx 1.9GHz using PLL (Phase Locked Loop) control. / The TXDA signal is used to control the modulation of this frequency to 1.87GHz to 1.93GHz. / Received signals are demodulated, filtered and sent to the BBIC via the RXDA line. / The RSSI (Radio Signal Strength Indicator) signal enables the implementation of diversity switching whereby two antennas can be mounted in different orientations and their signals compared. The one with better reception will be selected by the BBIC using the ANT1 and ANT2 lines.

12.6. POWER SUPPLY CIRCUIT

3.3V, 2.5Vand 5V is generated in CS. 3.3V is the power supply for logic circuit and RF module. 2.5V is used as the power supply of FPGA internal core. 5V is the power supply for DNIC and HDLC IC.

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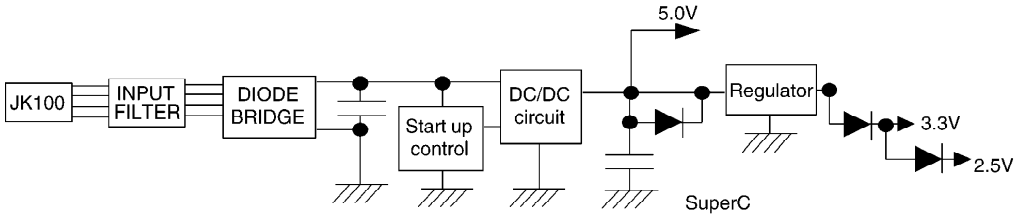

INPUT FILTER, DIODE BRIDGE
Input filter for noise rejection and diode bridge for misconnection protection.

DC/DC START UP CONTROL CIRCUIT
This circuit control start up of DC/DC converter IC for the quick recovery from power interruption.

DC/DC CONVERTER CIRCUIT
Generate 5.0V from DC40V power supply.

POWER BACK UP CIRCUIT
All power supply is back- upped by the primary electrolyte capacitor and secondary super capacitor.

12.7. CLOCK CIRCUIT

Three kinds of clock is used in CS.

CPU CLOCK
CPU clock and FPGA clock is used 9.6MHz divided cycle of 19.2MHz TCXO.

BBIC CLOCK
10.368MHz VCXO is used. Tweak frequency by changing the variable capacitance diode by DA signal from CPU.

DNIC CLOCK
10.24MHz crystal oscillator is used. It is used for Reference Clock of DNIC.

12.8. RESET CIRCUIT

It is reset by the signal from Power on Reset or CPU. The reset from Reset IC is reset by CPU or F-ROM, BBIC and HDLC is reset by the Port output from CPU.

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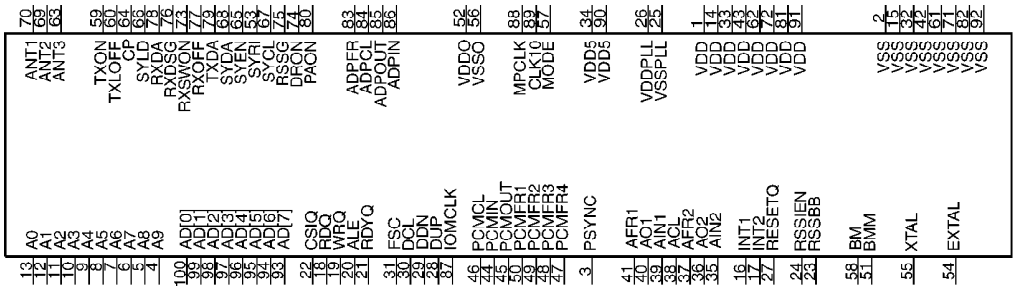
13. IC DATA

13.1. IC100 (BBIC)



Pin	Description	I/O	High	High-Z	Low	Pin	Description	I/O	High	High-Z	L
1	VDD	VDD	-	-	-	51	BMM	I	-	-	Fixe
2	VSS	VSS	-	-	-	52	VDD0	VDD	-	-	
3	PSYNC	I	Active	-	Normal	53	SYRI	O	Active	-	A
4	A9	I	Active	-	Active	54	EXTAL	O	Active	-	A
5	A8	I	Active	-	Active	55	XTAL	I	Active	-	A
6	A7	I	Active	-	Active	56	VSS0	VSS	-	-	
7	A6	I	Active	-	Active	57	MODE	I	-	-	Fixe
8	A5	I	Active	-	Active	58	BM	I	Fixed (3.3V)	-	
9	A4	I	Active	-	Active	59	no use (TXON)	O	-	-	
10	A3	I	Active	-	Active	60	no use (TXON)	O	-	-	
11	A2	I	Active	-	Active	61	VSS	VSS	-	-	
12	A1	I	Active	-	Active	62	VDD	VDD	-	-	
13	A0	I	Active	-	Active	63	no use (ANT3)	O	-	-	
14	VDD	VDD	-	-	-	64	no use (CP)	O	-	-	
15	VSS	VSS	-	-	-	65	SYEN	O	Active	-	No
16	INT1	O	Normal	-	Active	66	no use (SYLD)	I	-	-	
17	INT2	O	Normal	-	Active	67	SYCL	O	Active	-	A
18	RDQ	I	Normal	-	Active	68	SYDA	O	Active	-	A
19	WRQ	I	Normal	-	Active	69	ANT2	O	Active	-	No
20	ALE	I	Normal	-	Active	70	ANT1	O	Active	-	No
21	RDYQ	O	Normal	-	Active	71	VSS	VSS	-	-	
22	CSIQ	I	Normal	-	Active	72	VDD	VDD	-	-	
23	no use (RSSBB)	O	-	-	-	73	no use (RXSWON)	O	-	-	
24	RSSIEN	O	Normal	-	Active	74	DRON	O	Active	-	No
25	VSSPLL	VSS	-	-	-	75	RSSG	O	Active	-	No

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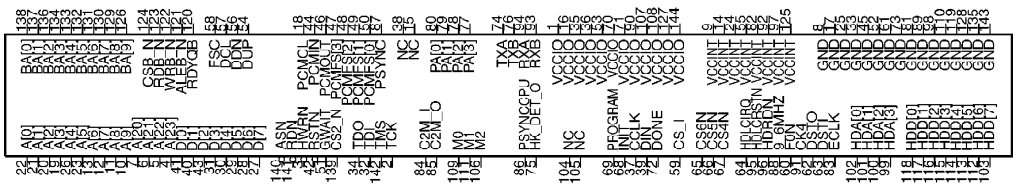
Pin	Description	I/O	High	High-Z	Low	Pin	Description	I/O	High	High-Z	L
26	VDDPLL	VDD	-	-	-	76	RXDSG	O	Active	-	Nc
27	RESETQ	I	Active	-	Normal	77	no use (RXOFF)	O	-	-	
28	DUP	O	Active	-	Active	78	RXDA	I	Active	-	Nc
29	DDN	I	Active	-	Active	79	TXDA	O	Active	-	A
30	DCL	I	Active	-	Active	80	PAON	O	Normal	-	A
31	FSC	I	Active	-	Normal	81	VDD	VDD	-	-	
32	VSS	VSS	-	-	-	82	VSS	VSS	-	-	
33	VDD	VDD	-	-	-	83	no use (ADPFR)	O	-	-	
34	VDD5	VDD5	-	-	-	84	no use (ADPCL)	O	-	-	
35	no use (AIN2)	I	-	-	-	85	no use (ADPOUT)	O	-	-	
36	no use (A02)	O	-	-	-	86	no use (ADPIN)	I	-	-	
37	no use (AFR2)	O	-	-	-	87	IOMCLK	I	-	-	Fixe
38	no use (ACL)	O	-	-	-	88	no use (MPCLK)	O	-	-	
39	no use (AIN1)	I	-	-	-	89	no use (CLK10)	O	-	-	
40	no use (A01)	O	-	-	-	90	VDD5	VDD5	-	-	
41	no use (AFR1)	O	-	-	-	91	VDD	VDD	-	-	
42	VSS	VSS	-	-	-	92	VSS	VSS	-	-	
43	VDD	VDD	-	-	-	93	AD7	I/O	Active	-	A
44	no use (PCMIN)	I	-	-	-	94	AD6	I/O	Active	-	A
45	no use (PCMOUT)	O	-	-	-	95	AD5	I/O	Active	-	A
46	no use (PCMCL)	O	-	-	-	96	AD4	I/O	Active	-	A
47	no use (PCMFR4)	O	-	-	-	97	AD3	I/O	Active	-	A
48	no use (PCMFR3)	O	-	-	-	98	AD2	I/O	Active	-	A
49	no use (PCMFR2)	O	-	-	-	99	AD1	I/O	Active	-	A
50	no use (PCMFR1)	O	-	-	-	100	AD0	I/O	Active	-	A

13.2. IC101 (FPGA)



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Pin	Description	I/O	High	High-Z	Low	Pin	Description	I/O	High	High-Z
1	VCC0	VCC	-	-	-	57	DCL	O	Active	-
2	TCK	I	-	-	Fixed (0V)	58	FSC	O	Active	-
3	HWRN	I	-	-	Active	59	CS_I	I	Normal	-
4	A23	I	Active	-	Active	60	FON	I	Normal	-
5	A22	I	Active	-	Active	61	GND	GND	-	-
6	A21	I	Active	-	Active	62	DSTO	O	Active	-
7	A20	I	Active	-	Active	63	DSTI	I	Active	-
8	GND	GND	-	-	-	64	no use (HDLCIRQ)		-	-
9	VCCINT	VCC	-	-	-	65	no use (CS6N)	O	-	-
10	A9	I	Active	-	Active	66	no use (CS5N)	O	-	-
11	A8	I	Active	-	Active	67	CS4N	O	Normal	-
12	A7	I	Active	-	Active	68	INIT	O	Normal	-
13	A6	I	Active	-	Active	69	PROGRAM	I	Normal	-
14	VCCINT	VCC	-	-	-	70	VCC0	VCC	-	-
15	NC		-	-	-	71	VCC0	VCC	-	-
16	VCC0	VCC	-	-	-	72	DONE	O	Active	-
17	GND	GND	-	-	-	73	GND	GND	-	-
18	PCMCL	I	-	-	-	74	no use (TXA)		-	-
19	A3	I	Active	-	Active	75	HK_DET_O	O	-	-
20	A2	I	Active	-	Active	76	no use (TXB)		-	-
21	A1	I	Active	-	Active	77	no use (PA3)	O	-	-
22	A0	I	Active	-	Active	78	no use (PA2)	O	-	-
23	A5	I	Active	-	Active	79	no use (PA1)	O	-	-
24	VCCINT	VCC	-	-	-	80	no use (PA0)	O	-	-
25	GND	GND	-	-	-	81	GND	GND	-	-
26	A4	I	Active	-	Active	82	VCCINT	VCC	-	-
27	D7	I/O	Active	-	Active	83	ECLK	O	Active	-
28	D6	I/O	Active	-	Active	84	C2M_I	I	Active	-
29	D5	I/O	Active	-	Active	85	C2M_O	O	Active	-
30	D4	I/O	Active	-	Active	86	PSYNCCPU	O	Active	-
31	D3	I/O	Active	-	Active	87	PSYNC	O	Active	-
32	TD1	I	-	-	Fixed (0V)	88	9_6MHz	I	Active	-
33	GND	GND	-	-	-	89	GND	GND	-	-
34	TD0	O	Fixed (3.3V)	-	-	90	VCC0	VCC	-	-
35	VCC0	VCC	-	-	-	91	CK4	I	Active	-
36	VCC0	VCC	-	-	-	92	VCCINT	VCC	-	-
37	CCLK	I	Active	-	Normal	93	no use (RXB)		-	-
38	NC	O	-	-	-	94	no use (RXA)		-	-

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Pin	Description	I/O	High	High-Z	Low	Pin	Description	I/O	High	High-Z
39	DIN	I	Active	-	Active	95	RSTN for HDLC	O	Normal	-
40	D1	I/O	Active	-	Active	96	RDN for HDLC	O	Normal	-
41	D0	I/O	Active	-	Active	97	VCCINT		-	-
42	RSTN	I	Normal	-	Active	98	GND	VCC	-	-
43	D2	I/O	Active	-	Active	99	A3 for HDLC	O	Active	-
44	no use (PCMIN)	I	-	-	-	100	A2 for HDLC	O	Active	-
45	GND	GND	-	-	-	101	A1 for HDLC	O	Active	-
46	no use (PCMOUT)	O	-	-	-	102	A0 for HDLC	O	Active	-
47	no use (PCMFS3)	I	-	-	-	103	D7 for HDLC	I/O	Active	-
48	no use (PCMFS2)	I	-	-	-	104	NC		-	-
49	no use (PCMFS1)	I	-	-	-	105	NC		-	-
50	no use (PCMFS0)	I	-	-	-	106	M2	I	-	-
51	GWAIT	O	Normal	-	Active	107	VCC0	VCC	-	-
52	GND	GND	-	-	-	108	VCC0	VCC	-	-
53	VCC0	VCC	-	-	-	109	M0	I	-	-
54	DUP	I	Active	-	Active	110	GND	GND	-	-
55	VCCINT	VCC	-	-	-	111	M1	I	-	-
56	DDN	O	Active	-	Active	112	D6 for HDLC	I/O	Active	-

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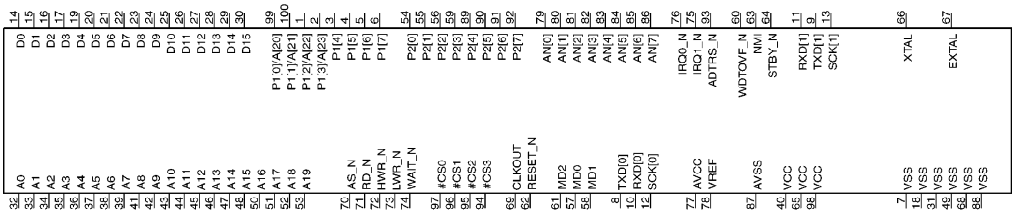
Pin	Description	I/O	High	High-Z	Low	Pin	Description	I/O	High	High-Z
113	D5 for HDLC	I/O	Active	-	Active	129	A8 for BBIC	O	Active	-
114	D4 for HDLC	I/O	Active	-	Active	130	A7 for BBIC	O	Active	-
115	D3 for HDLC	I/O	Active	-	Active	131	A6 for BBIC	O	Active	-
116	D2 for HDLC	I/O	Active	-	Active	132	A5 for BBIC	O	Active	-
117	D1 for HDLC	I/O	Active	-	Active	133	A4 for BBIC	O	Active	-
118	D0 for HDLC	I/O	Active	-	Active	134	A3 for BBIC	O	Active	-
119	GND	GND	-	-	-	135	GND	GND	-	-
120	RDYQB	I	Normal	-	Active	136	A2 for BBIC	O	Active	-
121	ALB_N	O	Normal	-	Active	137	A1 for BBIC	O	Active	-
122	WRB_N	O	Normal	-	Active	138	A0 for BBIC	O	Active	-
123	RDB_N	O	Normal	-	Active	139	CS2_N	I	Normal	-
124	CSB_N	O	Normal	-	Active	140	ASN	I	Normal	-
125	VCCINT	VCC	-	-	-	141	RDN	I	Normal	-
126	BA9	O	Active	-	Active	142	TMS	I		
127	VCC0	VCC	-	-	-	143	GND	GND	-	-
128	GND	VCC	-	-	-	144	VCC0	VCC	-	-

13.3. IC102 (CPU)



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Pin	Description	I/O	High	High-Z	Low	Pin	Description	I/O	High	High-Z
1	A22	O	Active	-	Active	51	A17	O	Active	-
2	A23	O	Active	-	Active	52	A18	O	Active	-
3	soft reset	O	Active	-	Normal	53	A19	O	Active	-
4	FPGA reset	O	Normal	-	Active	54	no use (P20)	O	Fixed (3.3V)	-
5	DC/DC stop	I	Active	-	Normal	55	FPGA PROGRAM	O	Normal	-
6	BBIC reset	O	Normal	-	Active	56	FPGA DONE	I	Active	-
7	VSS	VSS	-	-	-	57	MD0	I	-	-
8	TxD0	O	Active	-	Active	58	MD1	I	-	-
9	FPGA data	O	Active	-	Active	59	FPGA INIT	I	Normal	-
10	RxD0	I	Active	-	Active	60	no use (WDTOVF)	O	-	-
11	no use (P33)	O	Fixed (3.3V)	-	-	61	MD2	I	Fixed (3.3V)	-
12	no use (P34)	O	Fixed (3.3V)	-	-	62	RESETN	I	Normal	-
13	FPGA CLK	O	Active	-	Active	63	NMI	I	Fixed (3.3V)	-
14	D0	I/O	Active	-	Active	64	STBY	I	Fixed (3.3V)	-
15	D1	I/O	Active	-	Active	65	VCC	VCC	-	-
16	D2	I/O	Active	-	Active	66	XTAL	I	-	-
17	D3	I/O	Active	-	Active	67	EXTAL	I	Active	-
18	VSS	VSS	-	-	-	68	VSS	VSS	-	-
19	D4	I/O	Active	-	Active	69	ϕ	O	-	-
20	D5	I/O	Active	-	Active	70	AS	O	Normal	-
21	D6	I/O	Active	-	Active	71	RD	O	Normal	-
22	D7	I/O	Active	-	Active	72	HWR	O	Normal	-
23	D8	I/O	Active	-	Active	73	LWR	O	Normal	-
24	D9	I/O	Active	-	Active	74	WAIT	I	Normal	-
25	D10	I/O	Active	-	Active	75	IRQ1	I	Normal	-
26	D11	I/O	Active	-	Active	76	IRQ0	I	Normal	-
27	D12	I/O	Active	-	Active	77	AVCC	VCC	-	-
28	D13	I/O	Active	-	Active	78	Vref	I	-	-
29	D14	I/O	Active	-	Active	79	DIP SW1	I	Normal	-
30	D15	I/O	Active	-	Active	80	DIP SW2	I	Normal	-
31	VSS	VSS	-	-	-	81	DIP SW3	I	Normal	-
32	A0	O	Active	-	Active	82	DIP SW4	I	Normal	-
33	A1	O	Active	-	Active	83	ADC for RSSIF	I	-	-

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Pin	Description	I/O	High	High-Z	Low	Pin	Description	I/O	High	High-Z
34	A2	O	Active	-	Active	84	AN5	I	Fixed (3.3V)	-
35	A3	O	Active	-	Active	85	RDY	I	-	-
36	A4	O	Active	-	Active	86	DAC for OSC TRIM	O	-	-
37	A5	O	Active	-	Active	87	AVSS	VSS	-	-
38	A6	O	Active	-	Active	88	VSS	VSS	-	-
39	A7	O	Active	-	Active	89	input port for DIP SW5	I	Normal	-
40	VCC	VCC	-	-	-	90	input port for DIP SW6	I	Normal	-
41	A8	O	Active	-	Active	91	P26	I	-	-
42	A9	O	Active	-	Active	92	P27	I	Fixed (3.3V)	-
43	A10	O	Active	-	Active	93	RSSIEN	I	Normal	-
44	A11	O	Active	-	Active	94	IRQ7 HDLCIRQ	I	Normal	-
45	A12	O	Active	-	Active	95	CS2 for FPGA	O	Normal	-
46	A13	O	Active	-	Active	96	CS1 for SRAM	O	Normal	-
47	A14	O	Active	-	Active	97	CS0 for FLASH	O	Normal	-
48	A15	O	Active	-	Active	98	VCC	VCC	-	-
49	VSS	VSS	-	-	-	99	A20	O	-	-
50	A16	O	Active	-	Active	100	A21	O	Active	-

14. HOW TO REPLACE A FLAT PACKAGE IC

If you do not have the special tools (for example: SPOT HEATER) to remove the SPOT HEATER'S Flat IC, If you have solder (large amount) a soldering iron and a cutter knife, you can easily remove IC's even though large than 100 pin.

14.1. PREPARATION

14.1.1. Pb Solder

- SOLDER

Sparkle Solder 115A-1, 115B-1 or Almit Solder KR-19, KR-19RMA

- Soldering Iron

Tip Temperature of 662 ± 50°F (350 ± 10°C)

Note: We recommend a 30 to 40 Watt soldering iron. An expert may be able to use a 60 to 80 Watt iron where someone with less experience could overheat and damage the PCB foil

- Flux

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Recommended Flux: Specific Gravity →0.863.
(Original flux should be replaced daily.)

14.1.2. PbF Solder

- Soldering Iron

Tip Temperature of 700°F ± 20°F (370°C ± 10°C)
Note: We recommend a 30 to 40 Watt soldering iron. An expert may be able to use a 60 to 80 Watt iron where someone with less experience could overheat and damage the PCB foil.

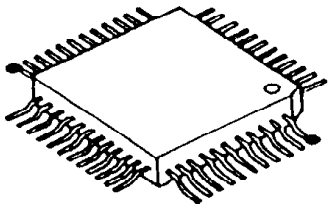
- Flux

Recommended Flux: Specific Gravity →0.82.
Type →RMA (lower residue, non-cleaning type)

Note: See ABOUT LEAD FREE SOLDER (PbF: Pb free) ().

14.2. PROCEDURE

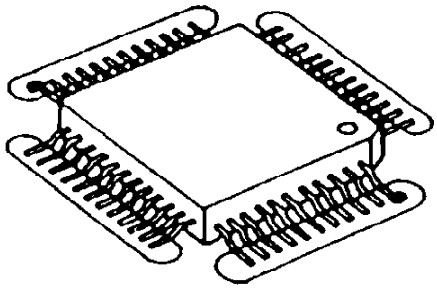
1. Tack the flat pack IC to the PCB by temporarily soldering two diagonally opposite pins in the correct positions on the PCB.



● - - - - - -Temporary soldering point.

Be certain each pin is located over the correct pad on the PCB.

2. Apply flux to all of the pins on the IC.



- - - - - - Flux

3. Being careful to not unsolder the tack points, slide the soldering iron along the tips of the pins while feeding enough solder to the

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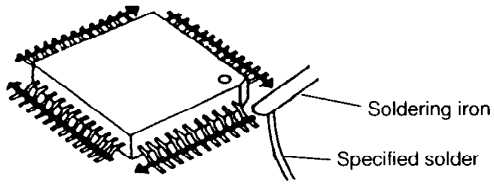
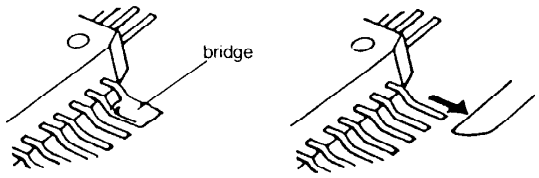
tip so that it flows under the pins as they are heated.



14.3. REMOVING SOLDER FROM BETWEEN PINS

1. **Add a small amount of solder to the bridged pins.**
2. **With a hot iron, use a sweeping motion along the flat part of the pin to draw the solder from between the adjacent pads.**



15. TERMINAL GUIDE OF ICS, TRANSISTORS AND DIODES

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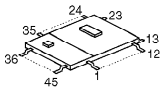
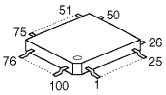
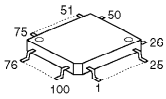
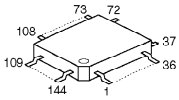
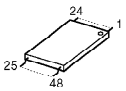
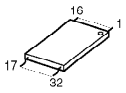
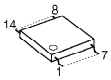
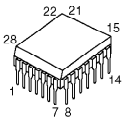
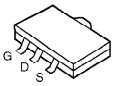
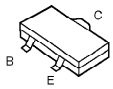
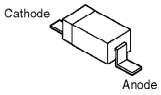
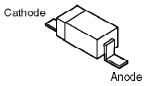
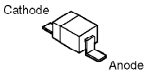
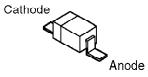
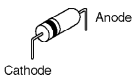
 PQWP2CD650CE	 PQVIPMB4729T	 PQVI2340FA10	 C1ZBZ0001996	 C3FBKD000181
PSVILM2575AD	PQVITC7WU04F	C0EBE0000117, PQVIXCP3302M, PQVIMC7101B5	C0JBAA000246	 PQVIBS2L1ST
 PSVIHDLV74TE	 PSVIMT8952BP, C1CB00001191	 2SB1132R, B1ADRC000008	 2SC2412K, PSVTDTC144EU	PQVTDTC143E, 2SD1819A
MA153	PQVDBAS16, PQVILM4040D2	 B0JCMG000007	 PSVDD1FS4-63, B0ECKM000003	 MA8220
 B0CCAB000020	 PQVDRLS73T			

16. CABINET AND ELECTRICAL PARTS LOCATION

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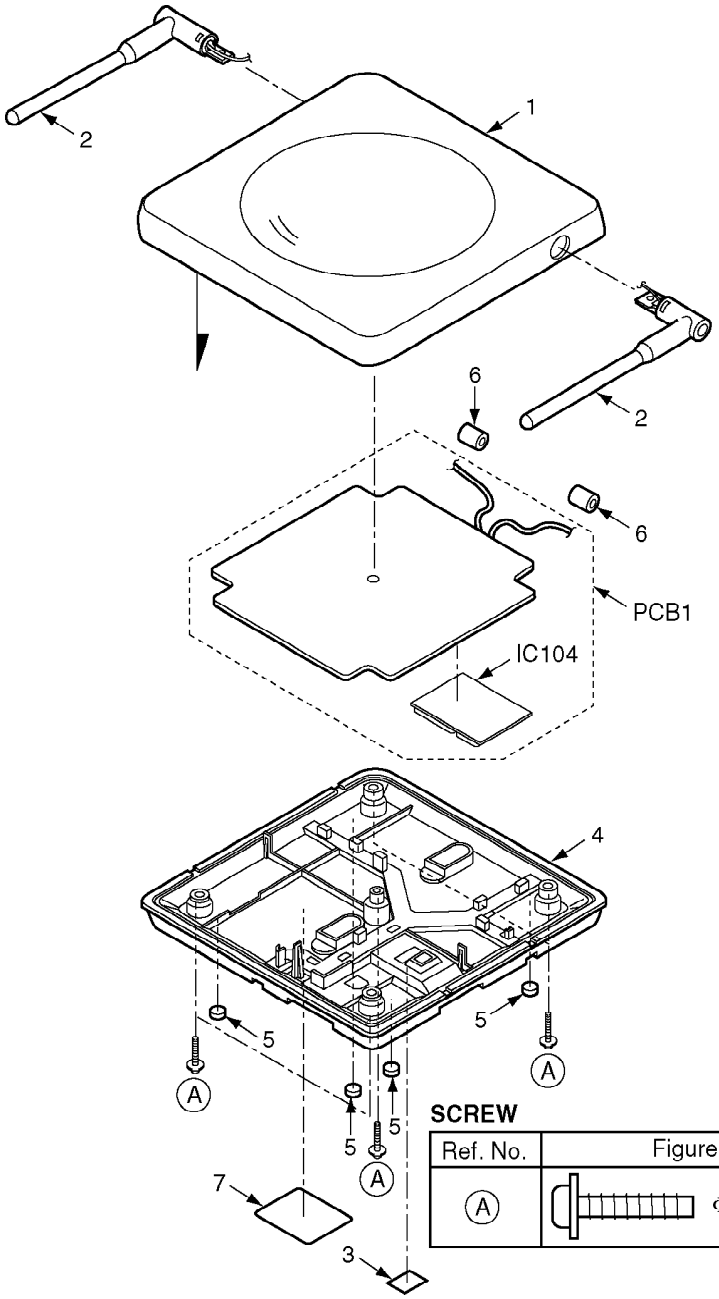

SCREW

Ref. No.	Figure	Part No.
Ⓐ	Φ3x16mm	XTW3+S16M

17. ACCESSORIES AND PACKING MATERIALS

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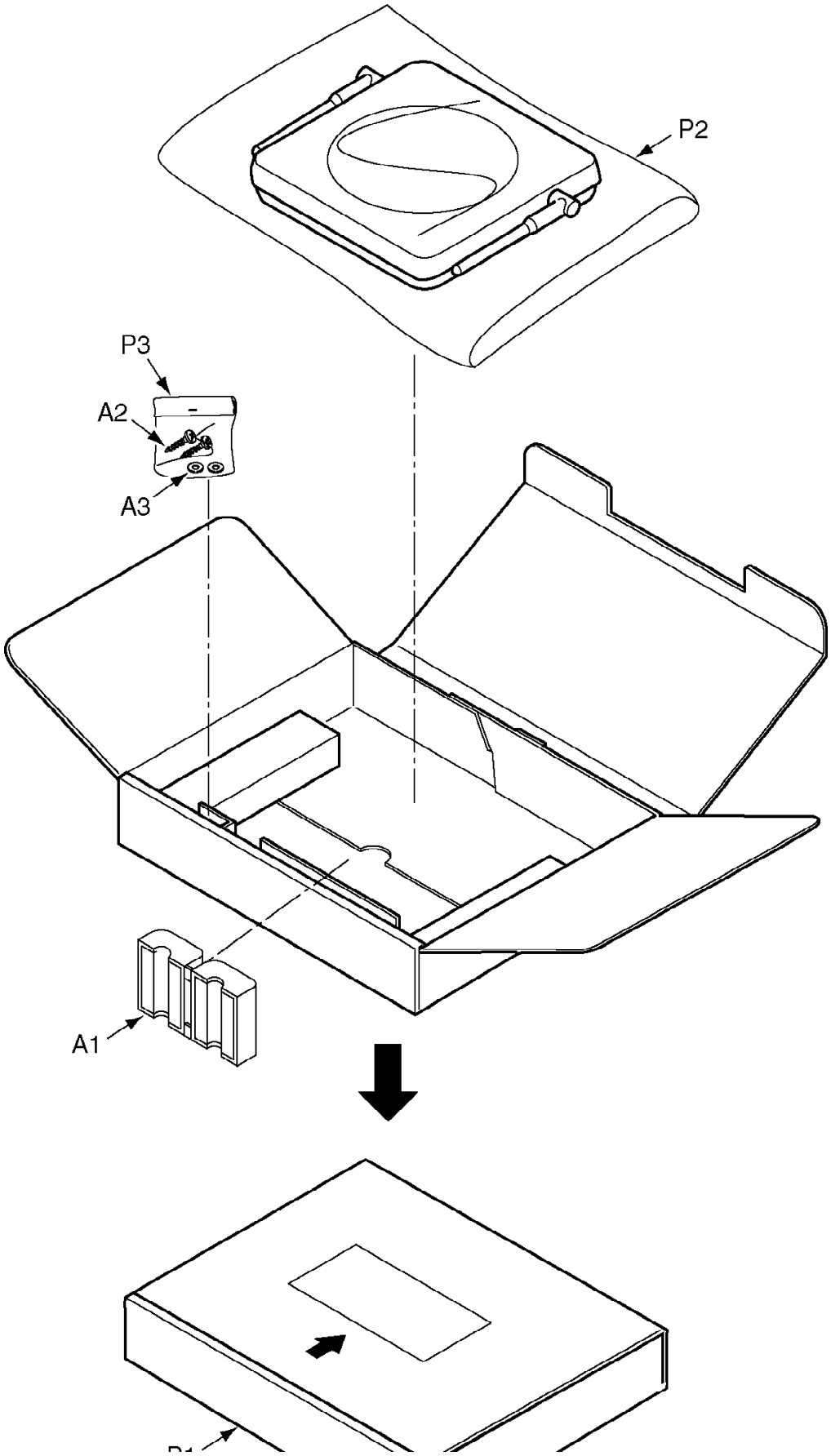

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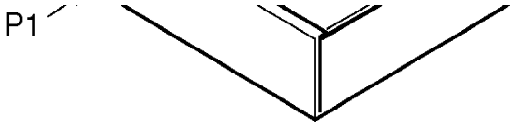

18. REPLACEMENT PARTS LIST

1. **RTL (Retention Time Limited)**
   Note : The marking (RTL) indicates that the Retention Time is limited for this item.
   After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is depends on the type of assembly, and in accordance with the laws governing parts and product retention.
   After end of this period, the assembly will no longer be available.
2. **Important safety notice**
   Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacture's specified parts.
3. **The S mark means the part is one of some identical parts. For that reason, it may be different from the installed part.**
4. **ISO code (Example: ABS-94HB) of the remarks column shows quality of the material and a flame resisting grade about plastics.**
5. **RESISTORS & CAPACITORS**
   Unless otherwise specified;
   All resistors are in ohms (Ω) K=1000 Ω , M=1000k Ω
   All capacitors are in MICRO FARADS (μ F) P= μ μ F
   ***Type & Wattage of Resistor**

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Type

ERC:Solid ERD:Carbon PQRD:Carbon	ERX:Metal Film ERG:Metal Oxide ER0:Metal Film	PQ4R:Carbon ERS:Fusible Resistor ERF:Cement Resistor

Wattage

10,16:1/8W	14,25:1/4W	12:1/2W	1:1W	2:2W	3:3W

*Type & Voltage of Capacitor

Type

ECFD:Semi-Conductor ECQS:Styrol PQCUV:Chip ECQMS:Mica	ECCD,ECKD,ECBT,PQCBC:Ceramic ECQE,ECQV,ECQG:Polyester ECEA,ECSZ:Electlytic ECQP:Polypropylene

Voltage

ECQ Type	ECQG ECQV Type	ECSZ Type	Others	
1H:50V 2A:100V 2E:250V 2H:500V	05:50V 1:100V 2:200V	0F:3.15V 1A:10V 1V:35V 0J:6.3V	0J :6.3V 1A :10V 1C :16V 1E,25:25V	1V :35V 50,1H:50V 1J :63V 2A :100V

18.1. CABINET AND ELECTRICAL PARTS LOCATION

Ref. No.	Part No.	Part Name & Description	Remarks
1	PSKM1036W1	CABINET BODY	ABC-94HB
2	N1CAAJY00004	ANTENNA	
3	PSHX1128Z	COVER	
4	PSKF1064Z1	CABINET COVER	ABC-94HB
5	PSHG1063Z	RUBBER PARTS	
6	KR16TT100510	MAGNET	
7	PSGT2218X	NAME PLATE	

18.2. ACCESSORIES AND PACKING MATERIALS

Ref. No.	Part No.	Part Name & Description	Remarks
A1	PQLB5D1	INSULATOR	
A2	PQHE5004Z	SCREW	
A3	XWG35FY	WASHER	
P1	PSZKA0142CEU	GIFT BOX	
P2	PQPH89Z	PROTECTION COVER	
P3	XZB05X08A03	PROTECTION COVER	

18.3. MAIN BOARD PARTS

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Ref. No.	Part No.	Part Name & Description	Remarks
PCB1	PSWPA0142CEU	MAIN BOARD ASS'Y (RTL)	
		(ICS)	
IC100	PQVIPMB4729T	IC	S
IC101	C1ZBZ0001996	IC	
IC102	PQVI2340FA10	IC	S
IC103	C3FBKD000181	IC	
IC104	PQWP2CD650CE	IC (RF UNIT)	
IC105	PQVIBS2L1ST	IC	S
IC108	C0EBE0000117	IC	
IC109	PQVIMC7101B5	IC	S
IC110	PQVITC7WU04F	IC	S
IC111	PSVIHDLV74TE	IC	
IC112	PSVIMT8952BP	IC	S
IC113	C1CB00001191	IC	
IC115	PSVILM2575AD	IC	
IC116	PQVIMC7101B5	IC	S
IC120	C0JBAA000246	IC	
IC200	PQVIXCP3302M	IC	S
IC203	PSWIA0142CEU	IC	
D103	PQVILM4040D2	IC	S
		(TRANSISTORS)	
Q100	2SD1819A	TRANSISTOR(SI)	
Q107	B1ADRC000008	TRANSISTOR(SI)	
Q112	2SB1132R	TRANSISTOR(SI)	S
Q113	PQVTDTC143E	TRANSISTOR(SI)	S
Q114	2SC2412K	TRANSISTOR(SI)	S
Q115	PSVTDTC144EU	TRANSISTOR(SI)	
Q116	2SC2412K	TRANSISTOR(SI)	S
		(DIODES)	
D100	MA153	DIODE(SI)	
D101	PQVDBAS16	DIODE(SI)	S
D102	B0CCAB000020	DIODE(SI)	
D105	PQVDRLS73T	DIODE(SI)	S
D106	PQVDRLS73T	DIODE(SI)	S
D109	B0JCMG000007	DIODE(SI)	
D110	B0JCMG000007	DIODE(SI)	
D111	B0JCMG000007	DIODE(SI)	
D112	B0JCMG000007	DIODE(SI)	
D113	B0JCMG000007	DIODE(SI)	
D114	B0JCMG000007	DIODE(SI)	
D115	B0JCMG000007	DIODE(SI)	
D116	B0JCMG000007	DIODE(SI)	
D117	B0JCMG000007	DIODE(SI)	
D118	PSVDD1FS4-63	DIODE(SI)	S
D122	B0ECKM000003	DIODE(SI)	
D123	PSVDD1FS4-63	DIODE(SI)	S
D125	MA8220	DIODE(SI)	
D126	MA8220	DIODE(SI)	
		(CONNECTORS)	
CN102	PSJP03A44ZAT	CONNECTOR,3P	S

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Ref. No.	Part No.	Part Name & Description	Remarks
X101	H1B1925B0021	CONNECTOR	
		(JACK)	
JK100	PSJJ1T011Z	JACK	S
		(CERAMIC FILTERS)	
FIL3	PSVFNBMK200T	CERAMIC FILTER	S
FIL6	J0HAAH000003	CERAMIC FILTER	
FIL7	J0HAAH000003	CERAMIC FILTER	
FIL8	J0HAAH000003	CERAMIC FILTER	
FIL9	J0HAAH000003	CERAMIC FILTER	
FIL10	J0HAAH000003	CERAMIC FILTER	
FIL11	J0HAAH000003	CERAMIC FILTER	
FIL12	J0HAAH000003	CERAMIC FILTER	
FIL13	J0HAAH000003	CERAMIC FILTER	
		(CRYSTAL OSCILLATORS)	
X100	H0J103500013	CRYSTAL OSCILLATOR	
X102	H0J102500004	CRYSTAL OSCILLATOR	
		(COILS)	
FIL1	PQLQR1H560KT	COIL	
FIL2	PQLQR1H560KT	COIL	
FIL5	ELJPA1R0MF	COIL	
L101	ELJPA100KF	COIL	
L102	ELJPA100KF	COIL	
L104	PSLQR3A331M	COIL	
		(VARISTORS)	
R403	D4ZZ00000024	VARISTOR	
R404	D4ZZ00000024	VARISTOR	
R405	D4ZZ00000024	VARISTOR	
R406	D4ZZ00000024	VARISTOR	
R407	D4ZZ00000024	VARISTOR	
R408	D4ZZ00000024	VARISTOR	
ZNR100	D4ED3560A001	VARISTOR	
ZNR101	D4ED3560A001	VARISTOR	
		(SWITCH)	
SW100	K0D169A00001	SWITCH	
		(TRANSFORMER)	
T100	ETJS13ZA17AB	TRANSFORMER	
		(RESISTORS)	
L109	ERJ3GEY0R00	0	
L110	ERJ3GEY0R00	0	
R101	ERJ3GEY0R00	0	
R102	ERJ3GEY0R00	0	
R103	ERJ3GEY0R00	0	
R104	ERJ3GEY0R00	0	
R105	ERJ3GEY0R00	0	
R106	ERJ3GEY0R00	0	

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Ref. No.	Part No.	Part Name & Description	Remarks
R107	ERJ3GEY0R00	0	
R108	ERJ3GEY0R00	0	
R109	ERJ3GEY0R00	0	
R111	ERJ3GEY0R00	0	
R113	ERJ3GEYJ271	270	
R115	ERJ3GEYJ102	1k	
R116	ERJ3GEYJ103	10k	
R117	ERJ3GEYJ473	47k	
R118	ERJ3GEYJ473	47k	
R119	ERJ3GEYJ473	47k	
R120	ERJ3GEYJ473	47k	
R121	ERJ3GEYJ103	10k	
R122	ERJ3GEYJ103	10k	
R123	ERJ3GEYJ102	1k	
R124	ERJ3GEYJ102	1k	
R126	ERJ3GEYJ104	100k	
R128	ERJ3GEY0R00	0	
R130	ERJ3GEYJ473	47k	
R131	ERJ3GEYJ473	47k	
R135	ERJ3GEYJ103	10k	
R136	ERJ3GEYJ103	10k	
R137	ERJ3GEYJ103	10k	
R138	ERJ3GEYJ473	47k	
R139	ERJ3GEYJ473	47k	
R140	ERJ3GEYJ473	47k	
R141	ERJ3GEYJ473	47k	
R142	ERJ3GEYJ473	47k	
R143	ERJ3GEYJ103	10k	
R144	ERJ3GEYJ221	220	
R145	ERJ3GEYJ103	10k	
R146	ERJ3GEYJ102	1k	
R147	ERJ3GEYJ102	1k	
R148	ERJ3GEYJ473	47k	
R149	ERJ3GEYJ473	47k	
R150	ERJ3GEYJ473	47k	
R151	ERJ3GEYJ473	47k	
R152	ERJ3GEYJ473	47k	
R153	ERJ3GEYJ473	47k	
R154	ERJ3GEYJ473	47k	
R155	ERJ3GEYJ473	47k	
R156	ERJ3GEYJ473	47k	
R157	ERJ3GEYJ473	47k	
R158	ERJ3GEYJ473	47k	
R164	ERJ3GEYJ102	1k	
R165	ERJ3GEYJ102	1k	
R166	ERJ3GEYJ103	10k	
R167	ERJ3GEYJ102	1k	
R169	ERJ3GEYJ470	47	
R170	ERJ3GEYJ473	47k	
R171	ERJ3GEYJ473	47k	
R172	ERJ3GEYJ102	1k	
R173	ERJ3GEY0R00	0	
R174	ERJ3GEYJ102	1k	
R175	ERJ3GEYJ102	1k	

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Ref. No.	Part No.	Part Name & Description	Remarks
R177	ERJ3GEYJ330	33	
R178	ERJ3GEYJ104	100k	
R179	ERJ3GEYJ104	100k	
R180	ERJ3GEYJ104	100k	
R181	ERJ3GEYJ104	100k	
R182	ERJ3GEYJ104	100k	
R183	ERJ3GEYJ104	100k	
R184	ERJ3GEYJ104	100k	
R185	ERJ3GEYJ104	100k	
R186	ERJ3GEYJ104	100k	
R187	ERJ3GEYJ104	100k	
R188	ERJ3GEYJ104	100k	
R189	ERJ3GEYJ104	100k	
R190	ERJ3GEYJ104	100k	
R191	ERJ3GEYJ104	100k	
R192	ERJ3GEYJ104	100k	
R193	ERJ3GEYJ104	100k	
R194	ERJ3GEYJ473	47k	
R195	ERJ3GEYJ102	1k	
R196	ERJ3GEYJ102	1k	
R197	ERJ3GEYJ102	1k	
R200	ERJ3GEYJ103	10k	
R210	ERJ3GEYJ101	100	
R211	ERJ3GEYJ101	100	
R212	ERJ3GEYJ101	100	
R213	ERJ3GEYJ101	100	
R214	ERJ3GEYJ101	100	
R215	ERJ3GEYJ101	100	
R216	ERJ3GEYJ473	47k	
R221	ERJ3GEYJ473	47k	
R222	ERJ3GEYJ473	47k	
R223	ERJ3GEYJ473	47k	
R224	ERJ3GEYJ473	47k	
R225	ERJ3GEYJ473	47k	
R226	ERJ3GEYJ473	47k	
R227	ERJ3GEYJ473	47k	
R229	ERJ3GEYJ473	47k	
R230	ERJ3GEYJ102	1k	
R231	ERJ3GEYJ102	1k	
R232	ERJ3GEYJ473	47k	
R233	ERJ3GEYJ473	47k	
R234	ERJ3GEYJ473	47k	
R235	ERJ3GEYJ473	47k	
R239	ERJ3GEY0R00	0	
R244	ERJ3GEYJ330	33	
R245	ERJ3GEYJ330	33	
R246	ERJ3GEYJ330	33	
R247	ERJ3GEYJ330	33	
R248	ERJ3GEYJ330	33	
R249	ERJ3GEYJ330	33	
R250	ERJ3GEYJ330	33	
R251	ERJ3GEYJ330	33	
R252	ERJ3GEYJ473	47k	
R253	ERJ3GEYJ473	47k	

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Ref. No.	Part No.	Part Name & Description	Remarks
R254	ERJ3GEYJ473	47k	
R255	ERJ3GEYJ473	47k	
R256	ERJ3GEYJ473	47k	
R257	ERJ3GEYJ473	47k	
R258	ERJ3GEYJ473	47k	
R259	ERJ3GEYJ473	47k	
R260	ERJ3GEYJ473	47k	
R261	ERJ3GEYJ473	47k	
R262	ERJ3GEYJ473	47k	
R263	ERJ3GEYJ473	47k	
R264	ERJ3GEYJ473	47k	
R265	ERJ3GEYJ473	47k	
R267	ERJ3GEYJ473	47k	
R268	ERJ3GEYJ473	47k	
R269	ERJ3GEYJ473	47k	
R270	ERJ3GEYJ473	47k	
R271	ERJ3GEYJ473	47k	
R272	ERJ3GEYJ473	47k	
R273	ERJ3GEYJ473	47k	
R275	ERJ3GEYJ330	33	
R276	ERJ3GEYJ330	33	
R278	ERJ3GEY0R00	0	
R291	ERJ3GEYJ473	47k	
R292	ERJ3GEYJ473	47k	
R293	ERJ3GEYJ473	47k	
R294	ERJ3GEYJ473	47k	
R295	ERJ3GEYJ473	47k	
R296	ERJ3GEYJ473	47k	
R297	ERJ3GEYJ473	47k	
R298	ERJ3GEYJ473	47k	
R299	ERJ3GEYJ473	47k	
R300	ERJ3GEYJ473	47k	
R301	ERJ3GEYJ473	47k	
R302	ERJ3GEYJ473	47k	
R303	ERJ3GEYJ473	47k	
R304	ERJ3GEYJ473	47k	
R305	ERJ3GEYJ473	47k	
R306	ERJ3GEYJ473	47k	
R307	ERJ3GEYJ473	47k	
R308	ERJ3GEYJ473	47k	
R309	ERJ3GEYJ473	47k	
R310	ERJ3GEYJ473	47k	
R311	ERJ3GEYJ473	47k	
R314	ERJ3GEYJ473	47k	
R315	ERJ3GEYJ473	47k	
R316	ERJ3GEYJ103	10k	
R317	ERJ3GEYJ103	10k	
R318	ERJ3GEYJ151	150	
R319	ERJ3GEYJ473	47k	
R320	ERJ3GEY0R00	0	
R321	ERJ3GEYJ103	10k	
R322	ERJ3GEYJ473	47k	
R323	ERJ3GEYJ473	47k	
R324	ERJ3GEYJ473	47k	

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Ref. No.	Part No.	Part Name & Description	Remarks
R325	ERJ3GEYJ102	1k	
R326	ERJ3GEYJ102	1k	
R327	ERJ3GEYJ102	1k	
R329	ERJ3GEYJ101	100	
R330	ERJ3GEYJ101	100	
R335	ERJ3GEYJ473	47k	
R339	ERJ3GEYJ391	390	
R340	ERJ3GEYJ470	47	
R344	ERJ3GEYJ473	47k	
R345	ERJ3GEYF472	4.7k	
R346	ERJ3GEYF152V	1.5k	
R348	ERJ3GEYJ123	12k	
R349	ERJ14YJ121	120	
R350	ERJ3GEYJ330	33	
R351	ERJ3GEYJ330	33	
R352	ERJ3GEYJ330	33	
R353	ERJ3GEYJ330	33	
R354	ERJ3GEYJ330	33	
R355	ERJ3GEYJ330	33	
R356	ERJ3GEYJ330	33	
R357	ERJ3GEYJ330	33	
R365	ERJ3GEYJ102	1k	
R366	ERJ3GEYJ473	47k	
R368	ERJ3GEY0R00	0	
R369	ERJ3GEYJ821	820	
R371	ERJ3GEYJ273	27k	
R387	ERJ3GEY0R00	0	
R390	ERJ3GEY0R00	0	
R391	ERJ14YJ150	15	S
R392	ERJ14Y0R00	0	
R393	ERJ3GEYJ223	22k	
R394	ERJ3GEYJ103	10k	
R396	ERJ3GEY0R00	0	
R397	ERJ3GEY0R00	0	
R398	ERJ14Y0R00	0	
R399	ERJ3GEY0R00	0	
R400	ERJ3GEY0R00	0	
R401	ERJ3GEY0R00	0	
R402	ERJ3GEY0R00	0	
R409	PQ4R10XJ102	1k	S
R411	ERJ3GEYJ330	33	
R412	ERJ3GEYJ330	33	
R413	ERJ3GEYJ330	33	
R414	ERJ3GEYJ330	33	
R416	ERJ3GEYJ332	3.3k	
R418	ERJ3GEYJ473	47k	
R419	ERJ3GEYJ473	47k	
R420	ERJ3GEY0R00	0	
R421	ERJ3GEY0R00	0	
R422	ERJ3GEYJ103	10k	
R423	ERJ3GEYJ103	10k	
R424	ERJ3GEYJ103	10k	
R425	ERJ3GEYJ393	39k	
R426	ERJ3GEYJ104	100k	

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Ref. No.	Part No.	Part Name & Description	Remarks
R427	ERJ3GEY0R00	0	
RA100	D1H83304A010	33	
RA101	D1H83304A010	33	
RA102	D1H83304A010	33	
RA103	D1H83304A010	33	
RA104	D1H83304A010	33	
RA105	D1H83304A010	33	
RA106	D1H83304A010	33	
RA107	D1H83304A010	33	
RA108	D1H83304A010	33	
RA109	D1H83304A010	33	
C100	ECUV1H100DCV	10p	
C101	ECUV1H100DCV	10p	
C102	ECUV1H100DCV	10p	
C103	ECUV1H100DCV	10p	
C104	ECUV1H100DCV	10p	
C105	ECUV1H100DCV	10p	
C106	ECUV1H103KBV	0.01	
C107	ECUV1E104ZFV	0.1	
C108	F2G0J4710005	470	
C109	ECUV1H100DCV	10p	
C110	ECUV1H100DCV	10p	
C111	ECUV1H560JCV	56p	
C112	ECUV1H100DCV	10p	
C113	ECUV1H100DCV	10p	
C114	ECUV1H100DCV	10p	
C115	ECUV1H100DCV	10p	
C120	ECUV1H221JCV	220p	S
C121	ECUV1H182KBV	0.0018	
C122	ECUV1H221JCV	220p	S
C123	ECUV1H103KBV	0.01	
C125	ECUV1H103KBV	0.01	
C127	ECUV1H471JCV	470p	S
C128	ECUV1H103KBV	0.01	
C129	ECUV1H471JCV	470p	S
C130	ECUV1H103KBV	0.01	
C131	ECUV1H471JCV	470p	S
C132	ECUV1H103KBV	0.01	
C133	ECUV1H471JCV	470p	S
C134	ECUV1H103KBV	0.01	
C135	ECUV1H471JCV	470p	S
C136	ECUV1H103KBV	0.01	
C137	ECUV1H471JCV	470p	S
C138	ECUV1H103KBV	0.01	
C139	ECUV1H471JCV	470p	S
C140	ECUV1H103KBV	0.01	
C141	ECUV1H471JCV	470p	S
C142	ECUV1H103KBV	0.01	
C151	ECUV1H270JCV	27p	
C152	ECUV1H103KBV	0.01	
C153	ECUV1E104ZFV	0.1	

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Ref. No.	Part No.	Part Name & Description	Remarks
C154	ECUV1H270JCV	27p	
C155	ECUV1H100DCV	10p	
C156	ECUV1H151JCV	150p	
C158	ECUV1E104ZFV	0.1	
C159	ECUV1H471JCV	470p	S
C160	ECUV1H103KBV	0.01	
C161	ECUV1H471JCV	470p	S
C162	ECUV1H103KBV	0.01	
C163	ECUV1H471JCV	470p	S
C164	ECUV1H103KBV	0.01	
C165	ECUV1H471JCV	470p	S
C166	ECUV1H103KBV	0.01	
C167	ECUV1H471JCV	470p	S
C168	ECUV1H103KBV	0.01	
C169	ECUV1H471JCV	470p	S
C170	ECUV1H103KBV	0.01	
C171	ECUV1H471JCV	470p	S
C172	ECUV1H103KBV	0.01	
C174	F2G1C1000014	10	
C179	ECUV1H103KBV	0.01	
C180	ECUV1H102KBV	0.001	
C183	ECUV1H100DCV	10p	
C184	ECUV1H471JCV	470p	S
C185	ECUV1H103KBV	0.01	
C186	ECUV1H100DCV	10p	
C187	ECUV1H820JCV	82p	
C188	ECUV1H100DCV	10p	
C191	ECUV1H100DCV	10p	
C192	F2G1C1000014	10	
C193	ECUV1H103KBV	0.01	
C194	ECUV1H103KBV	0.01	
C195	ECUV1H471JCV	470p	S
C196	ECUV1H103KBV	0.01	
C197	ECUV1H471JCV	470p	S
C198	ECUV1H103KBV	0.01	
C199	ECUV1H471JCV	470p	S
C200	ECUV1H103KBV	0.01	
C201	ECUV1H471JCV	470p	S
C202	ECUV1H103KBV	0.01	
C203	ECUV1H471JCV	470p	S
C204	ECUV1H103KBV	0.01	
C205	ECUV1H103KBV	0.01	
C206	ECUV1H103KBV	0.01	
C207	ECUV1E104ZFV	0.1	
C208	ECUV1H100DCV	10p	
C210	ECUV1H103KBV	0.01	
C211	ECUV1H471JCV	470p	S
C214	ECUV1H103KBV	0.01	
C215	ECUV1H471JCV	470p	S
C216	ECUV1H103KBV	0.01	
C217	ECUV1H471JCV	470p	S
C218	ECUV1C334ZFV	0.33	
C219	ECUV1C334ZFV	0.33	
C220	ECUV1H103KBV	0.01	

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Ref. No.	Part No.	Part Name & Description	Remarks
C221	ECUV1H471JCV	470p	S
C222	ECUV1H100DCV	10p	
C223	ECUV1H100DCV	10p	
C224	ECUV1H152KBV	0.0015	
C225	ECUV1E223KBV	0.022	
C226	ECUV1C334ZFV	0.33	
C227	ECUV1E104ZFV	0.1	S
C228	ECUV1E104ZFV	0.1	S
C229	ECUV1H103KBV	0.01	
C230	ECUV1H471JCV	470p	S
C238	ECUV1E104ZFV	0.1	
C239	F2G0J4710005	470	
C240	EECFE5R5474	0.547	
C241	ECUV1E104ZFV	0.1	
C242	ECUV1E104ZFV	0.1	
C243	F2G1A4710004	470	
C244	F2G1H1510001	150	
C246	ECUV1H100DCV	10p	
C247	ECUV1H100DCV	10p	
C248	ECUV1H103KBV	0.01	
C249	F2G1H1510001	150	
C250	ECUV1H103KBV	0.01	
C251	F2G1H1510001	150	
C255	F2J1V4R70004	4.7	
C257	F2J1V4R70004	4.7	
C271	ECUV1H103KBV	0.01	
C272	ECUV1H100DCV	10p	
C275	ECUV1H100DCV	10p	
C280	ECUV1H101JCV	100p	
C281	ECUV1H470JCV	47p	
C282	ECUV1H470JCV	47p	
C283	ECUV1H101JCV	100p	
C285	ECUV1H103KBV	0.01	
C286	ECUV1H471JCV	470p	S
C287	ECUV1H103KBV	0.01	
C288	ECUV1H471JCV	470p	S

18.4. FIXTURES AND TOOLS

Ref. No.	Part No.	Part Name & Description	Remarks
EC1	PSZZ1TDA0142	POWER SUPPLY ADAPTOR	
EC2	PSZZ2TDA0142	SERVICE JIG CABLE	
EC3	PSZZTD142CE	BATTERY BOX	

19. FOR THE SCHEMATIC DIAGRAM

Note:

1. DC voltage measurements are taken with an oscilloscope or a tester with a ground.

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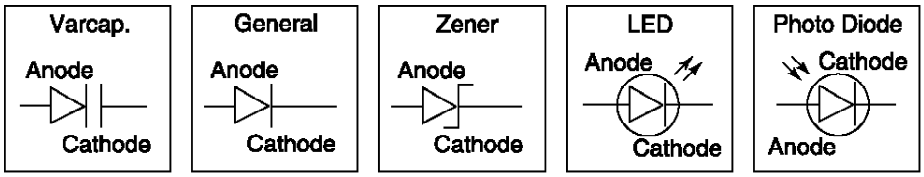
2. The schematic diagrams and circuit board may be modified at any time with the development of new technology.



Important safety notice
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of there components, use only manufacturer's specified parts.

20. SCHEMATIC DIAGRAM (MAIN)

21. PRINTED CIRCUIT BOARD(MAIN)

21.1. Component View

21.2. Bottom View

Y.M / KXTDA0142CEUK

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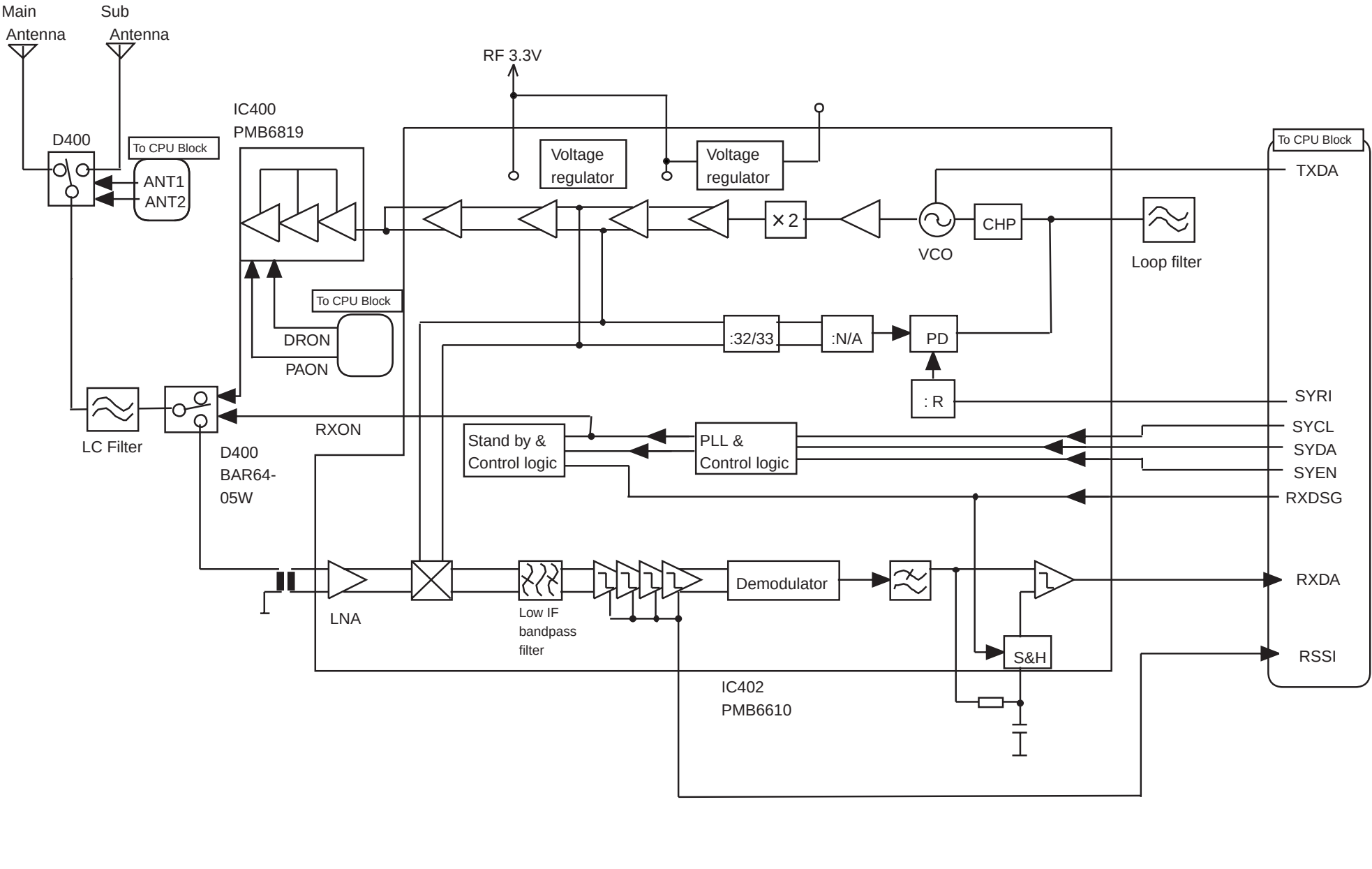
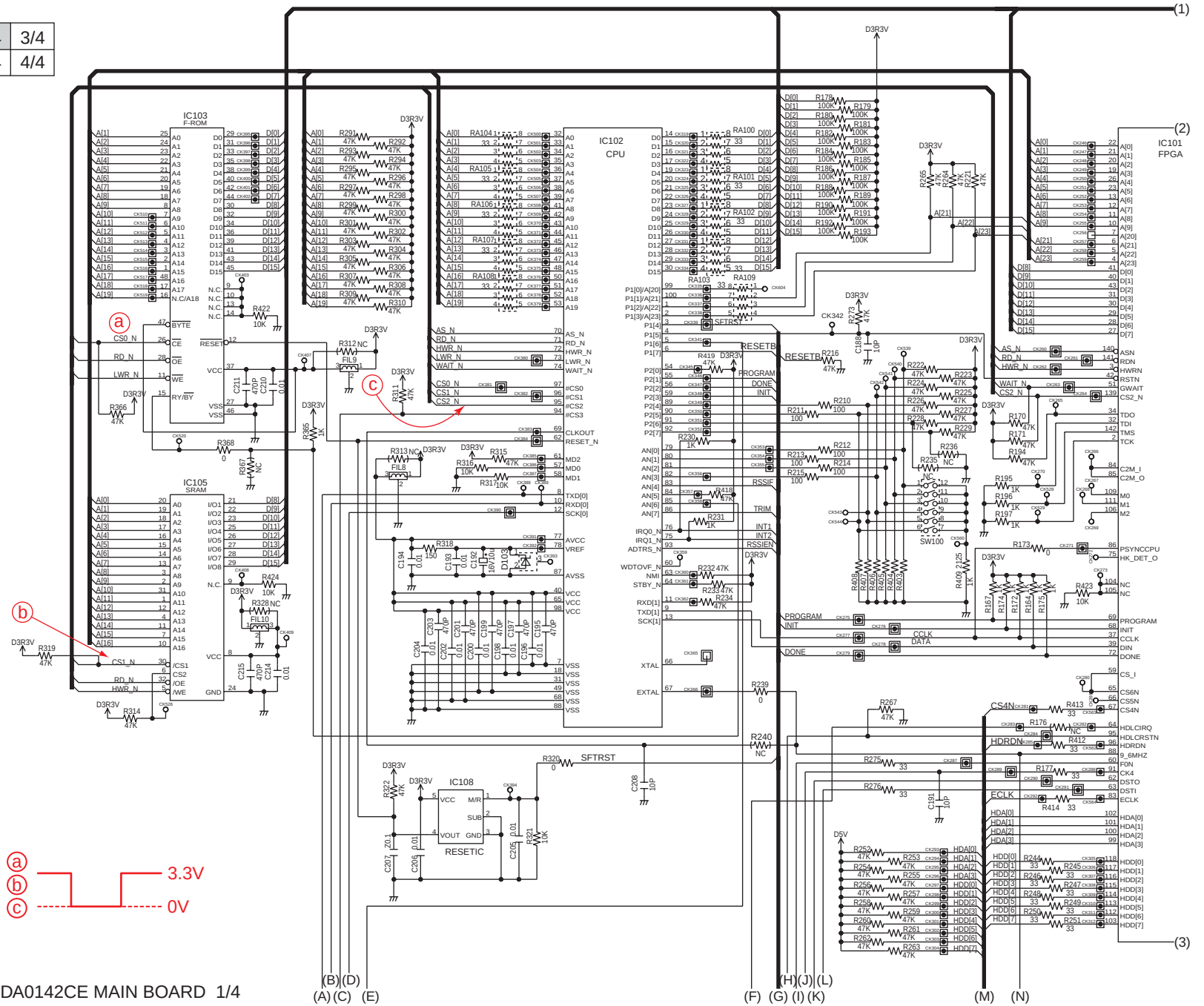
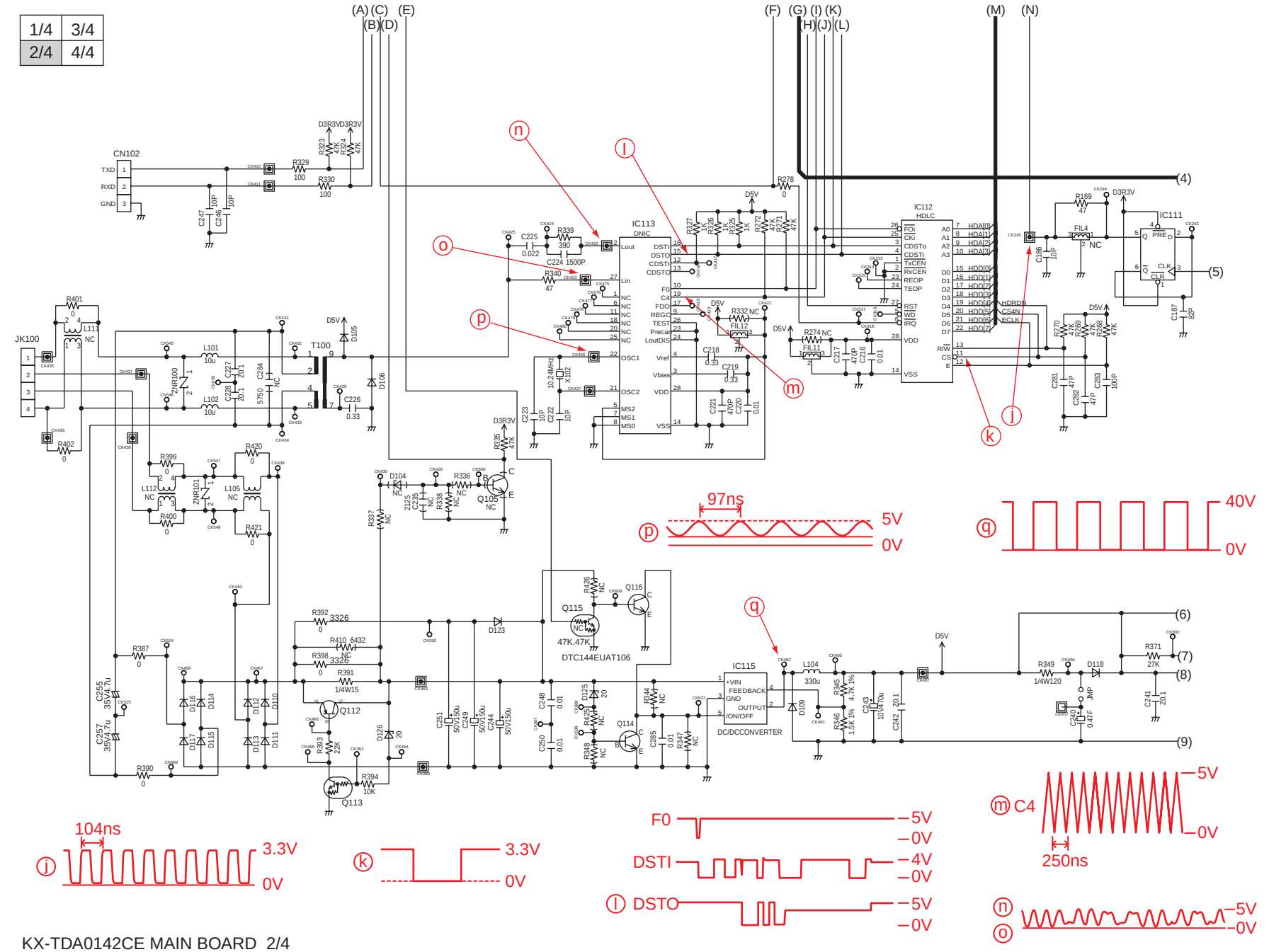


KX-TDA0142CE RF BLOCK

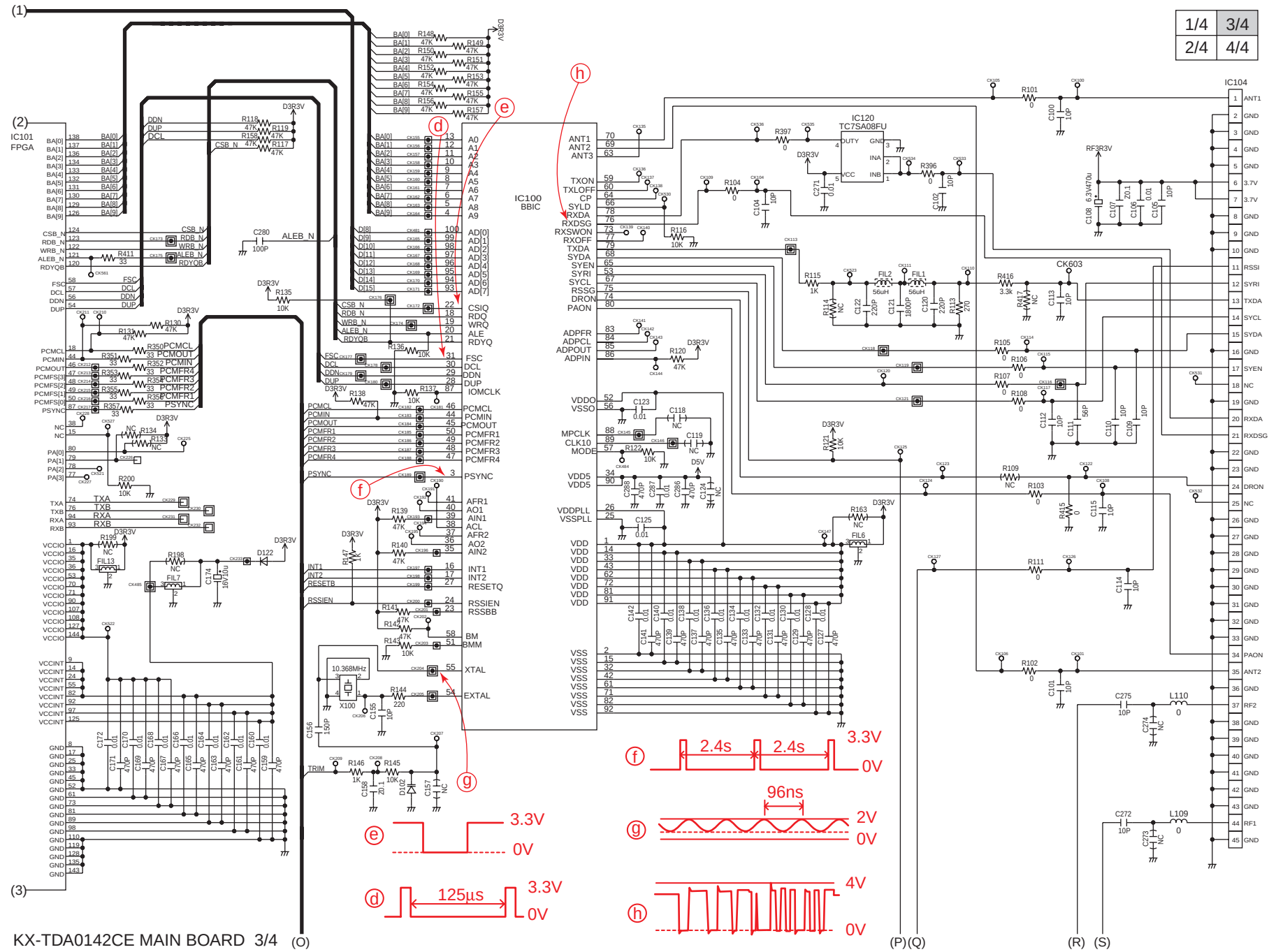


KX-TDA0142CE MAIN BOARD 1/4

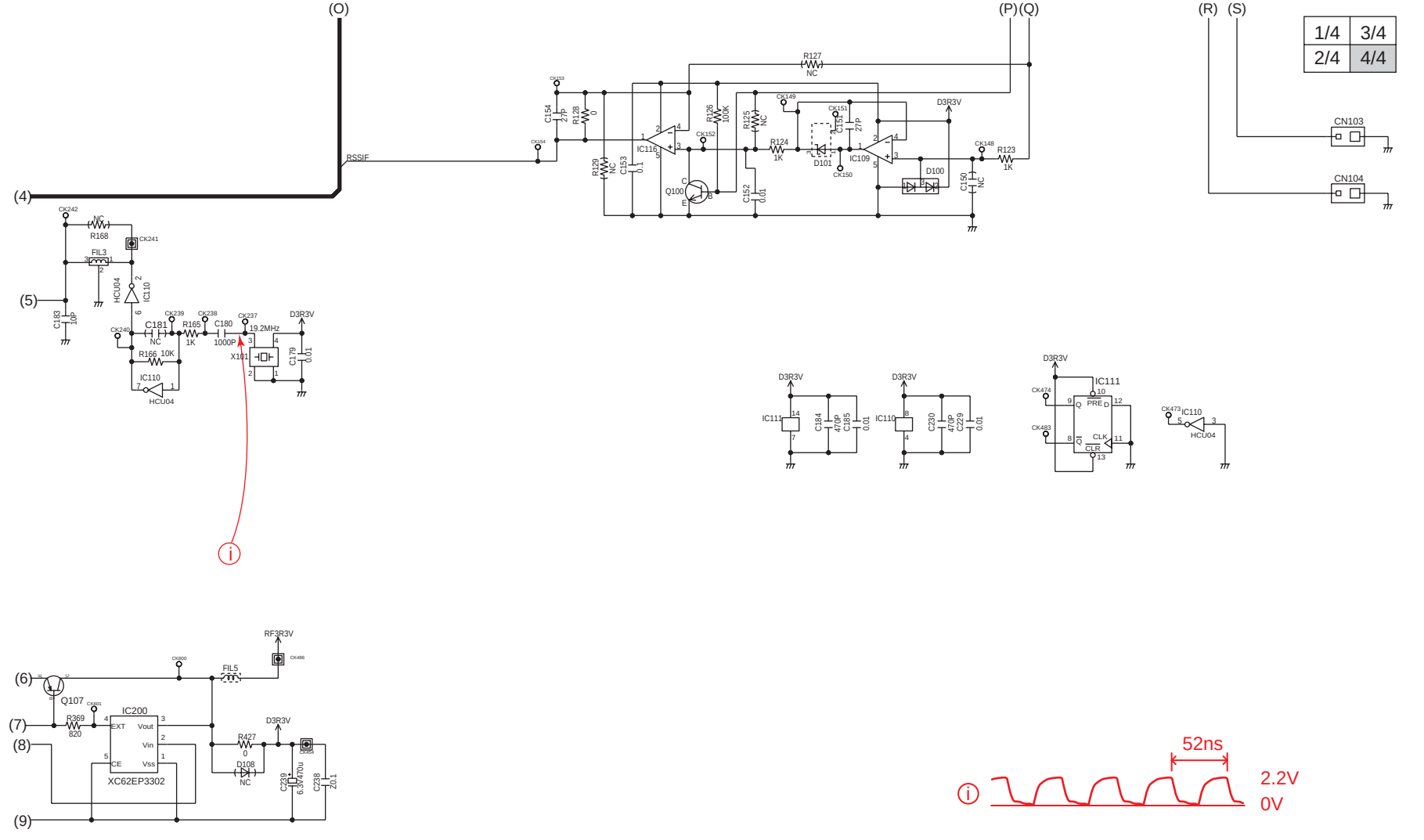
1/4	3/4
2/4	4/4

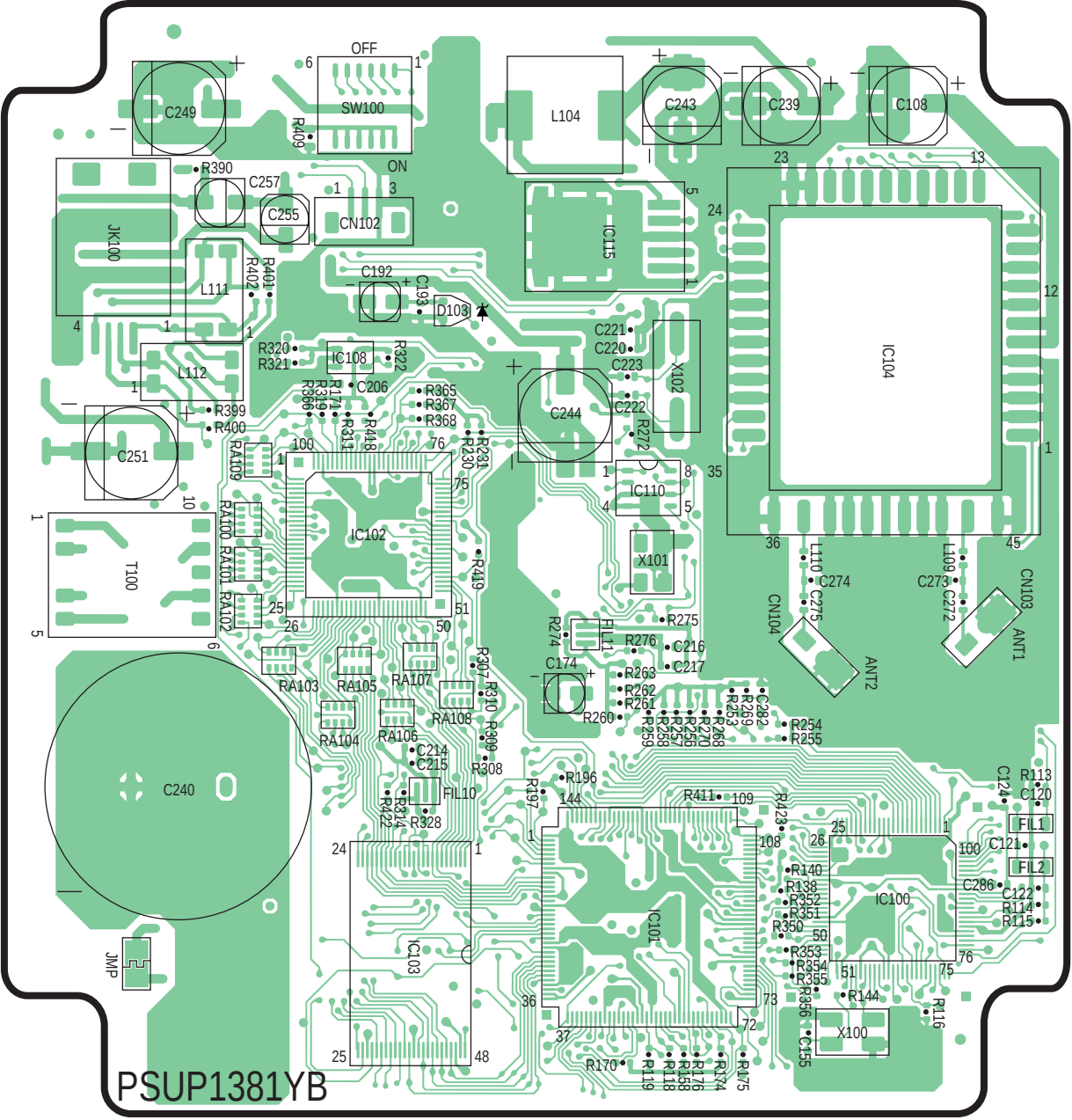


KX-TDA0142CE MAIN BOARD 2/4

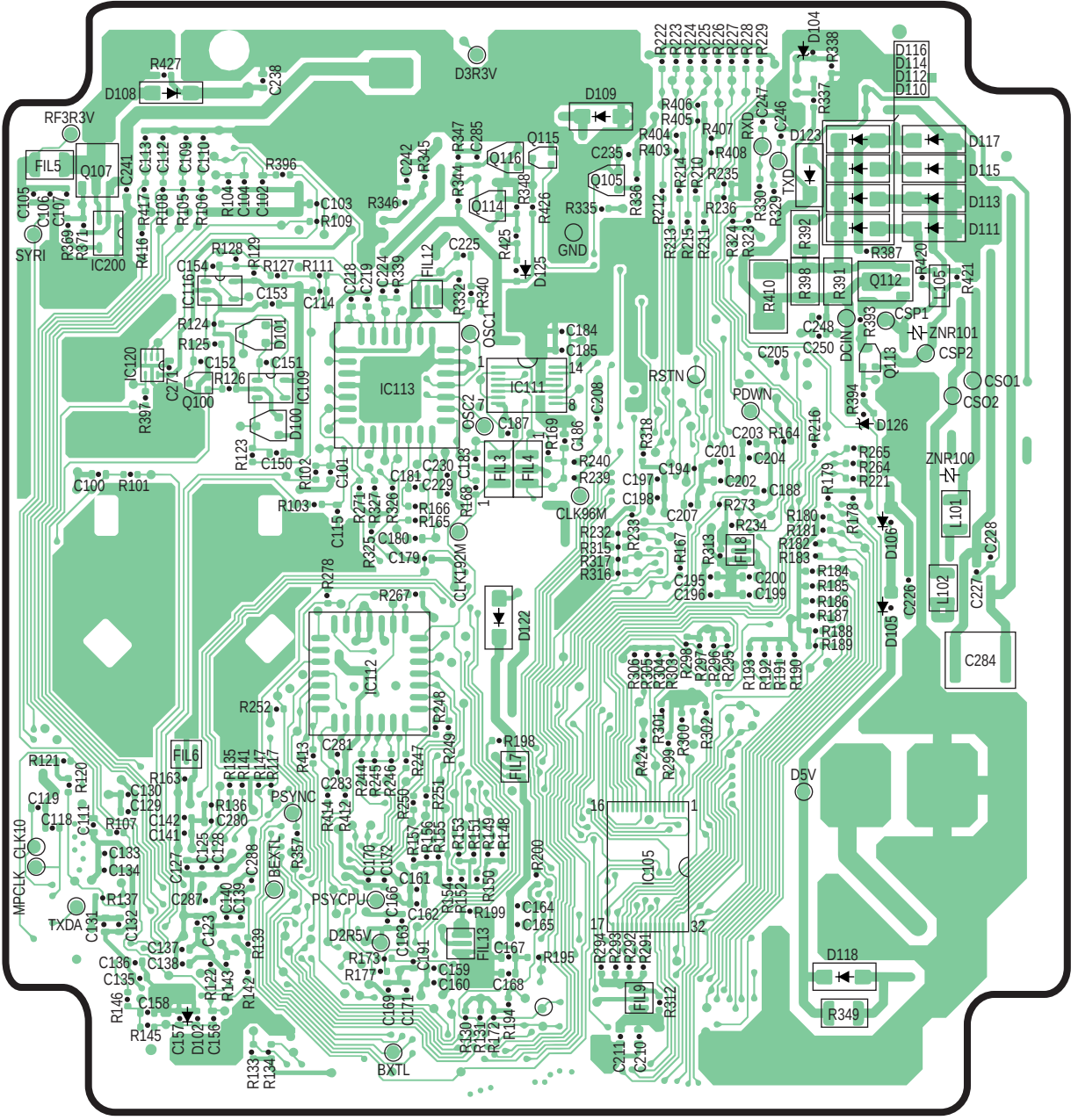


KX-TDA0142CE MAIN BOARD 3/4

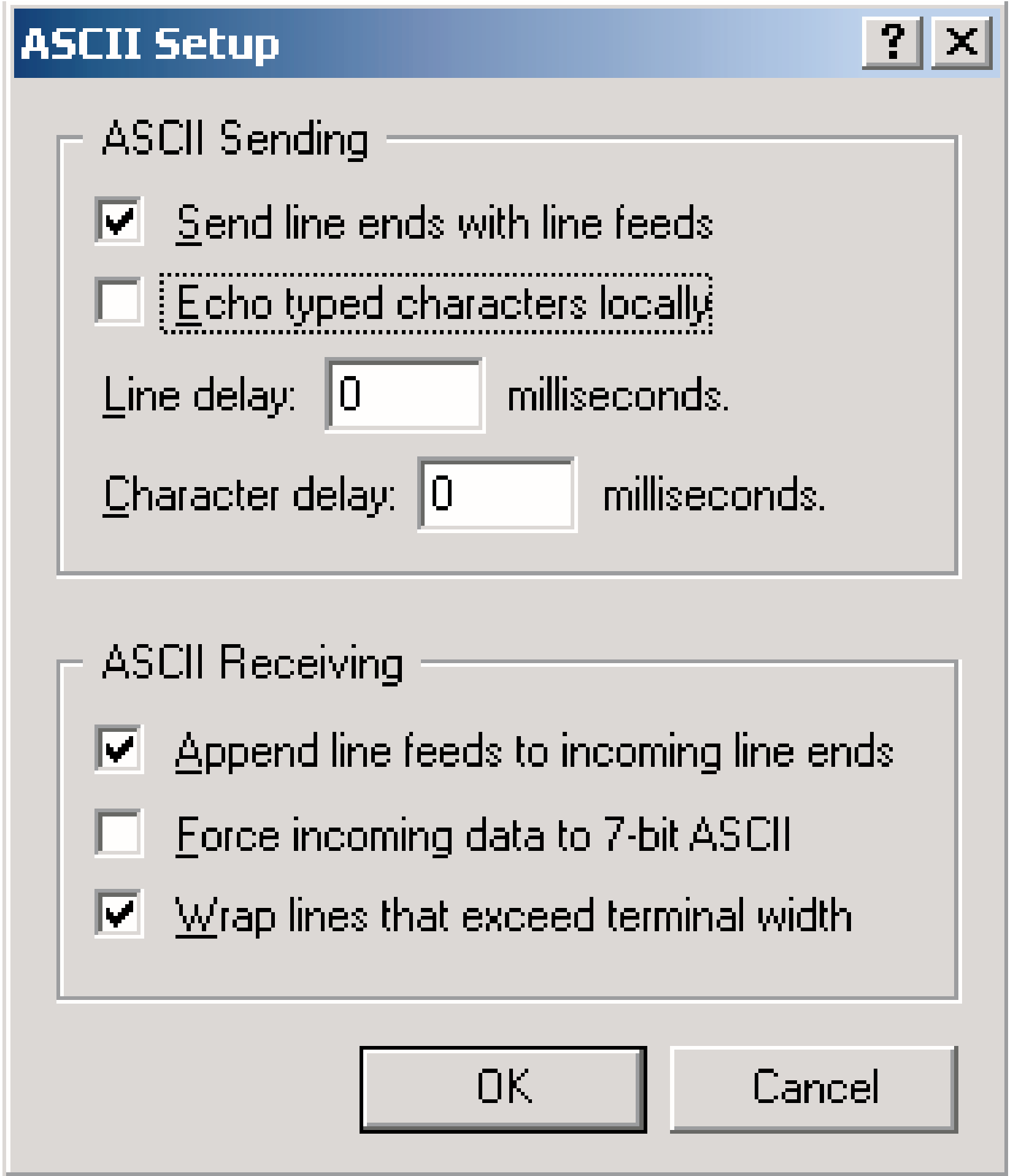

(O)
(P)(Q)
(R) (S)
1/4 3/4
2/4 4/4
RSSIF
(4)
(5)
(6)
(7)
(8)
(9)
CN103
CN104
R127 NC
C154 27P
R128 0
R126 100K
R125 NC
R124 1K
R123 1K
R129 NC
C153 0.1
C152 0.01
C150 NC
C135 27P
IC116
IC109
D101
D100
Q100
D3R3V
CK149
CK151
CK152
CK154
CK148
CK150
NC
R168
CK241
FIL3
HCU04
IC110
C183 10P
C181 NC
R165 1K
C180 1000P
19.2MHz
X101
C179 0.01
R166 10K
CK242
CK239
CK238
CK237
CK240
D3R3V
IC111
C184 470P
C185 0.01
C230 470P
C229 0.01
CK474
CK483
CK473
RF3R3V
CK486
FIL5
Q107
R369 820
IC200
EXT
Vout
Vin
CE
Vss
XC62EP3302
R427 0
D108 NC
C239 6.3V470u
C238 0.1
52ns
2.2V
0V

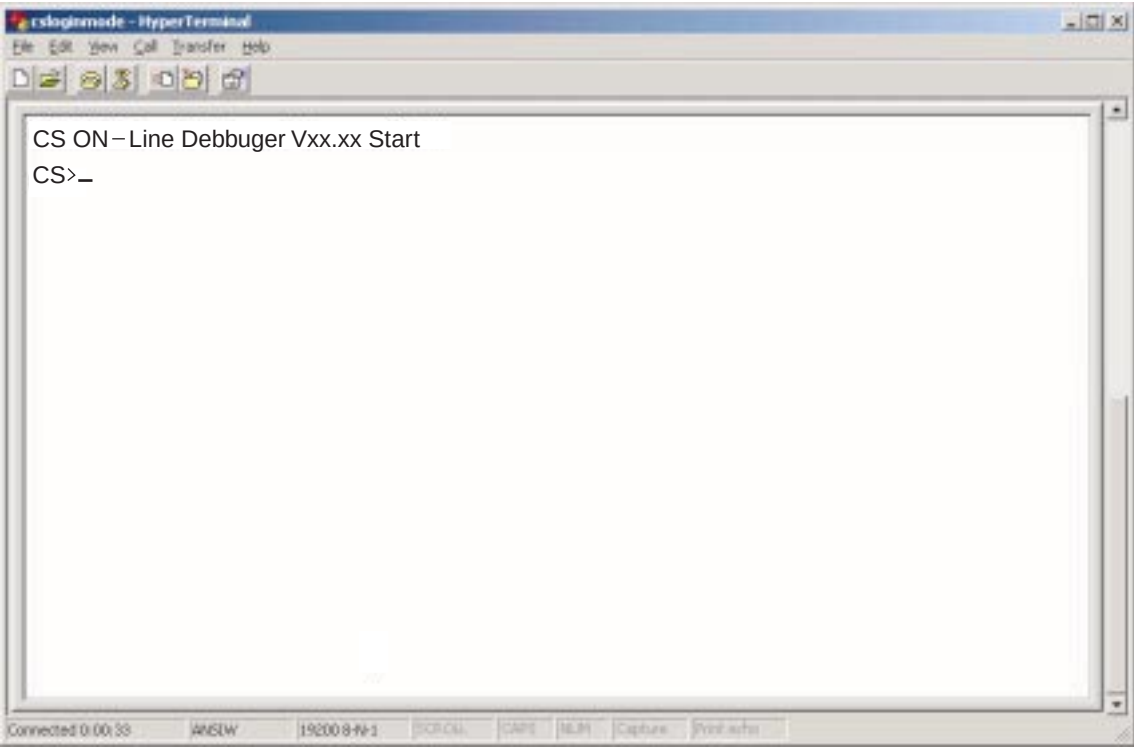


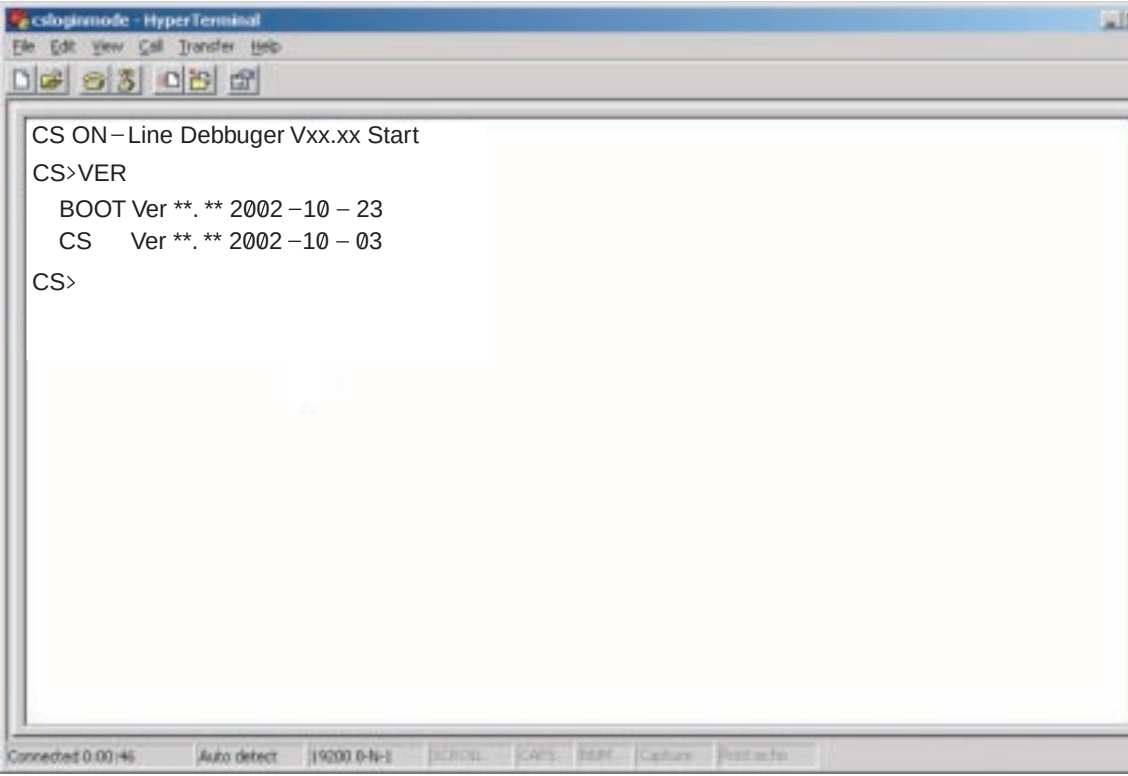
KX-TDA0142CE MAIN BOARD COMPONENT VIEW



KX-TDA0142CE MAIN BOARD BOTTOM VIEW


ASCII Setup
ASCII Sending
Send line ends with line feeds
Echo typed characters locally
Line delay: 0 milliseconds.
Character delay: 0 milliseconds.
ASCII Receiving
Append line feeds to incoming line ends
Force incoming data to 7-bit ASCII
Wrap lines that exceed terminal width
OK
Cancel


csloginmode - HyperTerminal
File Edit View Call Transfer Help
CS ON－Line Debbuger Vxx.xx Start
CS>
Connected 0:00:33
ANSIW
19200 8-N-1


csloginmode - HyperTerminal
File Edit View Call Transfer Help
CS ON－Line Debbuger Vxx.xx Start
CS>VER
BOOT Ver **. ** 2002－10－23
CS Ver **. ** 2002－10－03
CS>
Connected 0:00:46
Auto detect
19200 8-N-1

BLOCK DIAGRAM of KX-TDA0142CE CPU board